Technological Innovation Studies Program

Research Report

THE SMALL FIRM IN THE ALBERTAN OIL AND GAS INDUSTRY

by

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Department of Economics
The University of Calgary

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Rapport de recherche

Programme des études sur les innovations techniques

Industry, Trade and Commerce
Technology Branch
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Industrie et Commerce
Direction de la technologie
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The views and opinions expressed in this report are those of the author and are not necessarily endorsed by the Department of Industry, Trade and Commerce.

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INTRODUCTION

We are indebted to the Office of Science and Technology, Department of Industry, Trade and Commerce, Ottawa, for its generous funding of this Study. Mr. T.E. Clarke, Technology Branch, ITC, has kept us up to date with developments in government policies towards the small firm sector in Canada, and other pertinent issues.

The purpose of this Study has been to investigate the technologies-managerial, organizational, financial, production and other - that the small firm in the Alberta petroleum industry must command to achieve success. With the exception of Section 1, which is a statistical overview of the Canadian scenario, the focus is on Alberta. To our knowledge, this is the first study of the small firm in the petroleum industry; in consequence, we had to start from scratch. It is for this reason that our investigation at times feathered out into areas not apparently related to technologies. However, a comprehensive investigation of the modus operandi of the small firm, the environment in which it works and its position in the industry, was necessary for us to properly understand the technical problems that confront it.

We obtained the required information through interviews with the chief executives of sixty small enterprises domiciled in Calgary. The interviews were often followed up by telephone calls with a request for additional information or clarifications. Also, we sent special accounting forms to many small firms in the industry which do not

publish annual financial statements. The statistical material thus obtained was useful in our analysis of the financial position of small enterprises, and in other respects.

We would like to express our deep gratitude to the businessmen who very generously have given their valuable time to assist us. The response has been, invariably, encouraging and meaningful. Without the cooperation of the persons involved, this Study could never have been written. And, if this research has merits, the credit must go entirely to the many businessmen, and others, who not only provided us with the basic inputs that we needed but, more importantly, patiently taught us about the small firm sector.

We would like to acknowledge the assistance we received from Mr. Carl Nickle, President, Conventures Ltd., Calgary; Mr. Edgar H. Davis, President, Systems Investments Ltd., Calgary; Messrs. J.A. Mercier and R.A.N. Bonnycastle, President and Vice-President, Universal Gas Co. Ltd., Calgary; Mr. D.J. Turner, President, Lariat Oil and Gas, Ltd., Calgary; Mr. G.R. Hugo, Hugo Petroleum Investments, Calgary; and Mr. Rick Gusella, Head Analyst, Peters and Co., Ltd., Calgary. Mr. Bill Kurtze, President, the Independent Petroleum Association of Canada, discussed with us many problems of the small business.

We have also received useful information from the following government departments and agencies: Small Business Secretariat, ITC; Statistics Canada; Revenue Canada, Taxation; Consumer and Corporate Affairs, Canada; The Federal Business Development Bank; Alberta Treasury;

Social Services and Community Health, Alberta; Alberta Bureau of Statistics; Energy Resources Conservation Board, Alberta; and the Alberta Opportunity Company.

Several research assistants have helped in this research. Messrs. Bruce Craig, a graduate student in the Department of Economics, The University of Calgary (at present Regulatory Analyst with Alberta Gas Trunk Line) and John Kaiser, the Faculty of Management, The University of Calgary, were the principal interviewers. Their contribution to this Study goes far beyond the routine functions that are usually performed by research assistants. For they soon developed a keen interest in the small business and, throughout, have been making valuable suggestions to the author for improvements of many kinds. Ms. Janice Cheslak, at present Industrial Economist with Foster Research Centre, Calgary, and Messrs. M. Mortimer and Joe Tontini, both of the Faculty of Management, The University of Calgary, prepared and processed the statistics used in Sections 1 and 7 of this Study. Mr. Bob Gregg, a program analyst, performed the task of computer programming.

Some drafts of this work were read by Dr. Cornelius van de Panne of the Department of Economics, The University of Calgary, from whom the author received numerous constructive suggestions.

Any misrepresentations, misinterpretations and errors are, of course, the sole responsibility of the present writer.

Mrs. Pat Dalgetty typed the final draft of this work. We wish to thank her for an excellent execution of this unenviable task.

The reader will soon note that in the text we frequently quote statements that were made by businessmen, mainly during interviews. They illustrate succinctly particularly interesting points of view of our respondents. Mostly they are verbatim from the tapes but on occasion, for the sake of brevity, they were edited by us without changing their meaning.

SOME THOUGHTS ON THE OIL AND GAS INDUSTRY AND THE SMALL FIRM

On the industry

There is a romance in this industry.

It is a weird industry - you get involved in it, it gets into your blood and stays with you.

The oil and gas business is a complex one. It takes four to five years before you feel you are in. One cannot teach people about it - they have to learn it all on their own.

The industry is not a hard-nosed competitive business - it is a cooperative business. We are a very close-knit family working to the same end. You rely on business friends and repeat business.

It is a fast money and fast-paced business.

In this industry new things happen almost every week and you have to know what is happening around you.

At the university you learn rational processes, the majors are a good place where to learn about business and make contacts, but when you run your own business, you learn about yourself.

My valve broke and my competitors supplied me with a replacement to enable me to continue my work.

They gave me $1 million on the word of mouth - on the phone - long before the job was completed.

On the small independent business

The only control I am subject to is that of my wife.

It is a young man's job.

We are people with dreams - we dream about what will come out of the well.

You grow in steps not along a curve.

On the prerequisites for success in the small business

For this business you need intestinal fortitude.

You need a desk and a telephone, and you have to know how to make money - capital is not the most important thing.

Once you are on the move, money accumulates itself.

You must be able to work eighteen hours a day and seven days a week.

On the government

One day of the year they love you - the day when taxes are due - but the rest of the year they ignore you.

If you get one dollar of finance from them, you spend $1,000 to get it.

SECTION 1

THE SMALL FIRM SECTOR IN THE CANADIAN AND ALBERTAN OIL AND GAS INDUSTRY - A STATISTICAL OVERVIEW.

For the purpose of this section we used a statistical definition of the small firm in terms of its employment. Accordingly, the small firm is a business which employs up to 10 persons - managers, administrators and production workers.[1] This definition was dictated by the availability of the employment data for many firms in the industry. We are aware that this statistical concept of the small unit is not satisfactory, rather, it is a workable and convenient one. Later in this study we will measure the size of firm by its total assets. In general, the larger is the employment of a firm the larger are its assets, expenditures and revenues.

The oil and gas industry in Canada

Table 1.1 shows the distribution of firms in the oil and gas industry in Canada by employment-size. The data were obtained from the 1977-78 Nickle's Canadian Oil Register.[2]

The Register records numerous firms which do not appear to operate exclusively, or importantly, in the oil and gas industry. A few examples will suffice to illustrate this point: all the chartered banks are recorded in the Register; stockbrokers; trust companies; the airlines serving Western Canada; and the General Electric Company. These businesses, however, sell only a portion of

their total outputs to the oil and gas industry. If we had information on the percentage of the total sales of an enterprise, which is generated from the business done by it with the oil and gas industry, we would be in position to distinguish between those businesses which mainly, or entirely, operate in the industry (they sell to it a very substantial share of their output, say, 80 percent) and those which, while selling their outputs in many different markets, also sell some of it to the petroleum industry. The latter group could thus be excluded from our data on this basis. In view of a large number of firms that were recorded in the Register we were not in position to obtain the required percentages. But a general description of the output of each firm, which was provided in the Register, assisted us in eliminating those firms which, evidently, did not specifically operate in the oil and gas industry. In consequence, the total of over 3,200 units was reduced to 2,056 firms, that is, by 36 percent. As no employment data were given for 513 firms - 25 percent of the hitherto useable total - we were left with 1,543 units for the purpose of our statistical analysis. The extent to which the available statistics were affected is shown below by groups of activities.

Groups of activities	Total number of firms which were deemed to operate in the oil and gas industry	Number of firms for which employment data were not available	Number of firms deemed to operate in the oil and gas industry for which employment data were available
1	676	327	349
2	422	47	375
3	335	58	277
4	21	2	19
5	71	15	56
6	11	4	7
7	38	5	33
8	50	17	33
9	51	4	47
10	56	5	51
11	62	5	57
12	58	4	54
13	205	20	185
	2056	513	1543

Source: Computed from the Nickle's Oil Register, 1977-78.

The groups of activities are as follows:[3]

1. Oil and gas explorers and producers.
2. Service and supply companies.
3. Consultants (engineering, geological, geophysical, surveying and other).
4. Data processors.
5. Engineers, pipeline contractors, designers, constructors and fabricators.
6. Financial and investment companies.
7. Geophysical and exploration drilling contractors.
8. Lease brokers and land agents.
9. Oilwell drilling contractors.
10. Oilwell service companies.

TABLE 1.1

Distribution of firms by size, the oil and gas industry, Canada, 1977-78

	Size of firms by employment	Number of firms	%
The small firm sector	1 - 4	470	30.5
	5 - 10	211	13.7
	11 - 20	249	16.1
	21 - 50	241	15.6
	51 - 100	153	9.9
	101 - 200	81	5.2
	201 - 500	59	3.8
	501 - 1000	35	2.3
	1001 - 2000	22	1.4
	2001 - 5000	19	1.2
	5001 -	3	0.2
TOTALS		1,543	100.0

Source: Computed from the Nickle's Canadian Oil Register, 1977-78.

11. Pipeline companies and power distributors.

12. Refiners, processors, marketers and plant operators.

13. Transportation and oilfield construction companies.

Table 1.1 shows that small firms - to reiterate, with employment per firm of no more than 10 persons - accounted for 44.2 percent of the total number of 1,543 units in Canada.[4] The smallest size unit, namely, the firm employing up to four persons, and which will be referred to in this study as the "mini-small" firm (while the firm with the employment of five to ten persons will be denoted as the "maxi-small" firm), represented 30.5 percent of the total number of all firms. Evidently, this unit dominated numerically both the industry as a whole and, much more so, the small business sector - it accounted for 69 percent of the latter. If, for a moment, we extend the statistical concept of the small firm to the employment of 1-20 persons per firm, the "small firm sector", thus defined, represented 60 percent of the total number of firms in the industry.

As seen, percentage shares of the total number of firms were, on the whole, inversely related to size of firms. Notably, the three largest corporations accounted for one-fifth of one percent only of the total number of firms.

The data of Table 1.1 enabled us to make a very tentative estimate of the total direct employment that the oil and gas industry generated in Canada. This estimate is shown in Table 1.2 and it comes to over 200,000 persons, or 2.1 percent of the employed labour in Canada in 1977 (9.7 million).[5]

TABLE 1.2

Total employment in the oil and gas industry,

Canada, 1977-78

	Size of firms by employment	Average employment per firm	Number of firms	Employment	%
The small firm sector	1 - 4	2.5	470	1,175.0	0.59
	5 - 10	7.5	211	1,582.5	0.79
	11 - 20	15.5	249	3,859.5	1.93
	21 - 50	35.5	241	8,555.5	4.27
	51 - 100	75.5	153	11,551.5	5.77
	101 - 200	150.0	81	12,150.0	6.06
	201 - 500	350.5	59	20,679.5	10.32
	501 - 1000	750.5	35	26,267.5	13.11
	1001 - 2000	1500.5	22	33,011.0	16.48
	2001 - 5000	3500.5	19	66,509.5	33.20
	5001 -		3	15,003.0	7.49
TOTALS			1,543	200,341.0	100.00

Source: Table 1.1.

TABLE 1.4

Distribution of all firms by headquarter location, the oil and gas industry, Canada, 1977-78

	Size of firm by employment	Calgary	Edmonton	Other Alberta	Other Canada	Abroad	Totals	%	Alberta	%
The small firm sector	1 - 4	335	33	31	46	25	470	30.5	399	31.8
	5 - 10	125	28	35	15	8	211	13.7	188	15.0
	11 - 20	133	44	40	26	6	249	16.1	217	17.3
	21 - 50	114	50	34	37	6	241	15.6	198	15.7
	51 - 100	82	30	15	21	5	153	9.9	127	10.1
	101 - 200	34	15	8	20	4	81	5.2	57	4.5
	201 - 500	26	10	-	23	-	59	3.8	36	2.9
	501 - 1000	17	4	-	14	-	35	2.3	21	6.7
	1001 - 2000	10	2	-	8	2	22	1.4	12	0.9
	2001 - 5000	2	-	-	17	-	19	1.2	2	0.2
	5001 -	-	-	-	3	-	3	0.2	-	-
	TOTALS	878	216	163	230	56	1,543	100.0	1,257	100.0
	Percentages	56.9	14.0	10.6	14.9	3.6	100.0			

Source: See Table 1.1.

Table 1.4 shows the distribution of the 1,543 firms by the geographic location of their headquarters as follows: Calgary, Edmonton, other Alberta, other Canada, and abroad. As many as 1,257 firms, or just over 81 percent of the total, had their headquarters in Alberta, and of the above total of the Albertan firms, 878 units, or 70 percent, were domiciled in Calgary. This finding confirms the generally known fact that the Canadian petroleum industry is highly concentrated in Alberta and that Calgary is its most important headquarter-city.[6]

It will also be observed that the "largest" corporations (employment of more than 2001 persons per firm) were domiciled in "Other Canada". There were 22 such corporations in the industry and only two had their headquarters in Alberta.[7] But smaller units were predominantly operating in Alberta. Of the 681 small businesses in Canada, 587, or 86 percent, were domiciled in Alberta. We will come to this point later.

The information given in the Register permitted us to study the form of organization of the businesses operating in the industry. Out of a total number of 2,056 firms in Canada (all units, regardless of whether the employment data were or were not available for them), 2,043 firms, or 99.4 percent, were incorporated companies. Only six firms were individual ownerships and seven were partnerships. With the exception of one proprietorship, all the above firms were located in Alberta and they were very small by employment per firm.

Table 1.5 reveals the organizational linkages that existed

TABLE 1.3

Distribution of firms by groups of activities, the oil and gas industry, Canada, 1977-78

Groups of Activities	Number of firms	%
1.	349	22.6
2.	375	24.3
3.	277	17.9
4.	19	1.2
5.	56	3.6
6.	7	0.4
7.	33	2.1
8.	33	2.1
9.	47	3.0
10.	51	3.3
11.	57	3.7
12.	54	3.5
13.	185	12.0
TOTALS	1,543	100.0

Source: See Table 1.1.

The above result is an underestimate of the actual direct employment. First, as explained earlier, we ignored in our calculations 1,144 firms on the ground that they did not qualify by the nature of their output for inclusion into the oil and gas industry and, second, for 513 firms, which were deemed to belong to the industry, no data of employment were given in the Register. Both groups of firms, of course, contributed to the total employment. It will also be noted that the uppermost employment class-interval is open and, to be on the safe side, we took into our calculations its lower limit.

The table shows that the small firm sector accounted for a mere 1.4 percent of the total employment in the industry. The statistics reveal a positive relation between employment shares and size of firms with the exception of the group of the three dominant units. The largest employment share (33 percent) was recorded by the 19 firms with the employment of 2,001-5,000 persons per firm.

Table 1.3 provides information on the distribution of the 1,543 firms here under examination among the thirteen individual groups of activities, referred to earlier. The largest number of firms - 24 percent of the total - were in service and supply. This group was followed by producers, explorers and developers with 23 percent; consultants, 18 percent; and transportation and oil field constructors, 12 percent. The smallest group were financial and investment firms which recorded a 0.4 percentage share. It is notable that the three numerically largest groups, which comprised altogether 1,001 units, accounted for 65 percent of the total number of firms in the industry.

Table 1.6

Organizational links, by groups of activities, the oil and gas industry

Alberta, 1977-78

Groups of activities	(1) Affiliates	%	(2) Controllers	%	(3) Affiliates-Controllers	%	(4) Totals (1)&(2)	(5) Industry Totals	(1), (2) and (3) as percentages of (5) (1)	(2)	(3)
1.	195	39.1	130	88.4	47	90.3	325	502	38.8	25.9	9.4
2.	126	25.2	3	2.0	2	3.8	129	338	37.3	0.9	0.6
3.	41	8.2	3	2.0	-	-	44	289	14.2	1.0	-
4.	4	0.8	-	-	-	-	4	20	20.0	-	-
5.	21	4.2	-	-	-	-	21	57	36.8	-	-
6.	1	0.2	-	-	-	-	1	9	11.1	-	-
7.	17	3.4	-	-	-	-	17	35	48.5	-	-
8.	8	1.6	-	-	-	-	8	46	17.4	-	-
9.	16	3.2	-	-	-	-	16	45	35.5	-	-
10.	9	1.8	-	-	-	-	9	47	19.1	-	-
11.	21	4.2	8	5.4	2	3.8	29	40	52.5	20.0	5.0
12.	13	2.6	1	0.7	1	1.9	14	29	44.8	3.4	3.4
13.	27	5.4	2	1.4	-	-	29	171	15.8	1.8	-
Totals and	449	100.0	147	100.0		100.0	646	1628			
Percentages	77.2		22.8				100.0				
					52			3.2			
	27.5		9.0					36.5			

Source: See Table 1.1

among the 2,056 firms. There were 882 units, or 43 percent of the total, that were either affiliated with other firms (affiliates) or were controlling one or more firms (controllers) - 669 units belonged to the first category and 213 to the second. Some units, which were affiliated were also controlling other firms. There were 90 such affiliates-controllers and they accounted for 4.3 percent of the total of 2,056 businesses.

The data point to a high degree of organizational interdependencies among the firms investigated, particularly in pipeline companies and power distributors (group 11), producers, explorers and developers (1), refiners, processors, marketers and plant operators (12), geophysical and exploration drilling contractors (7), and service and supply companies (2). In three groups of activities (1, 2 and 11) there were all three forms of organizational interlinks and in three groups (3, 12 and 13) there were no affiliates-controllers. Finally, in six groups, only affiliates were present.

The Alberta oil and gas industry

Table 1.6 supplies statistical information on the network of organizational interlinks among the 1,628 firms which were domiciled by headquarters in Alberta (to reiterate, we had no employment data for a proportion of these units).[8]

Twenty-seven percent of the total were affiliates; 9 percent, controllers; and 3 percent, affiliates-controllers. It thus transpires that the most common link in the Alberta industry was that of affiliation - 449 firms were affiliates. Of this total, 39 percent

Table 1.7

Employment provided by the oil and gas industry,

Alberta, 1977-78

	Size of firms by employment	Average employment per size of firm	Number of firms	%	Employment per size of firm	%
The small firm sector	1-4	2.5	399	31.7	997	1.2
	5-10	7.5	188	15.0	1,410	1.7
	11-20	15.5	217	17.3	3,365	4.0
	21-50	35.5	198	15.7	7,029	8.3
	51-100	75.5	127	10.1	9,588	11.4
	101-200	150.5	57	4.5	8,578	10.2
	201-500	350.5	36	2.7	12,618	14.9
	501-1000	750.5	21	1.7	15,760	18.7
	1001-2000	1500.5	12	0.9	18,006	21.3
	2001-5000	3500.5	2	0.2	7,001	8.3
	TOTALS		1,257	100.0	84,354	100.0

Source: See Table 1.1.

were producers, explorers and developers. The controllers and affiliates-controllers in the industry were again concentrated in this group which comprised 88 percent of the former and 90 percent of the latter units. And, out of the total of 502 firms in the group of producers, explorers and developers, 39 percent were affiliates, 26 percent were controllers and 9 percent were affiliates-controllers. This evidence, and that obtained earlier, suggests that the group in question is numerically very important in the industry as a whole and that it has a very intricate pattern of organizational interlinks. This situation apparently reflects a need for horizontal combination and vertical integration, and other linkages, in the complex process of finding, extracting and developing fossil energy.

Our tentative estimate of the total direct employment provided by the 1,257 firms of all sizes domiciled in Alberta, for which we had employment data (see Table 1.4), is given in Table 1.7. The total comes to 84,354 persons and it is an underestimate for the reasons which were given earlier in connection with our estimate of the total employment in the industry in Canada in Table 1.2. The above figure represents 9.9 percent of the total employment in the Province of Alberta in 1977 (835,000).[9] This percentage is much higher than the corresponding percentage of the total employment generated by the industry in Canada, which was earlier estimated by us at about 2 percent. In view of the very high degree of concentration of the industry in Alberta, and other relevant considerations, the disparity in question is not unexpected.

Table 1.8

Distribution of small firms by groups of activities, the oil and gas industry, Canada, 1977-78

Groups of activities	Number of firms: the mini-firm	the maxi-firm	Totals	%
1.	176	51	227	33.3
2.	86	67	153	22.5
3.	147	31	178	26.1
4.	6	3	9	1.3
5.	3	3	6	0.9
6.	2	2	4	0.6
7.	3	5	8	1.2
8.	22	4	26	3.8
9.	2	1	3	0.4
10.	9	6	15	2.2
11.	4	1	5	0.7
12.	2	8	10	1.5
13.	8	29	37	5.4
Totals and Percentages	470	211	681	100.0
	69.0	31.0	100.0	

Source: See Table 1.1.

The small firm sector contributed only 2.9 percent of the total employment. Of the two subsets of the small business, the maxi-small firm generated relatively more employment with 1.7 percent.

We observe in Table 1.7 a striking inverse overall relationship between employment shares of firms and shares of the total number of firms. In both cases the two biggest corporations depart from this pattern. The most important single employer, with 21 percent of the total, was the group of 12 firms with the per-firm employment of 1001-2000 persons.

The small firm sector in the Canadian oil and gas industry

We now turn to the small firm sector in the Canadian petroleum industry and will deal with the group of 681 small firms (see Tables 1.1 and 1.4) for which we had employment data. Lest we introduce a serious bias, we hesitate to make assumptions about the employment distribution of the firms for which the employment statistics were not provided in the Register but it appears to us that most of them were relatively small enterprises.

Table 1.8 is a distribution of the 681 small businesses by groups of activities. The mini-small firm (470 units) by far dominated the small firm sector with a 69 percentage share of the total. It will be observed that one-third of all small firms (227 units) operated in production, exploration and development of oil and gas. In sharp contrast, only three small units were oilwell drilling contractors and four were in finance and investment. Besides the dominant

Table 1.9

Distribution of small firms by headquarter location, the oil and gas industry, Canada, 1977-78

Location	Number of firms and percentages the mini-firm		the maxi-firm		Totals	%
Calgary	335	71.3	125	59.2	460	67.5
Edmonton	33	7.0	28	13.3	61	8.9
Other Alberta	31	6.6	35	16.6	66	9.7
Other Canada	46	9.8	15	7.1	61	8.9
Abroad	25	5.3	8	3.8	33	4.8
Totals and	470	100.0	211	100.0	681	100.0
Percentages	69.0		31.0		100.0	

Source: See Table 1.1.

Table 1.10

Distribution of small firms by groups of activities, the oil and gas industry, Alberta, 1977-78

Groups of activities	Number of firms and percentages the mini-firm		the maxi-firm		Totals	%
1.	145	36.3	43	22.9	188	32.0
2.	68	17.0	60	31.9	128	21.8
3.	131	32.8	29	15.4	160	27.3
4.	6	1.5	3	1.6	9	1.5
5.	3	0.7	3	1.6	6	1.0
6.	2	0.5	2	1.1	4	0.7
7.	3	0.7	5	2.7	8	1.4
8.	20	5.0	3	1.6	23	3.9
9.	1	0.2	1	0.5	2	3.4
10.	8	2.0	6	3.2	14	2.4
11.	2	0.7	1	0.5	4	0.7
12.	3	0.5	6	3.2	8	1.4
13.	7	1.7	26	13.8	33	5.6
Totals and	399	100.0	188	100.0	587	100.0
Percentages	68.0		32.0		100.0	

Source: See Table 1.1.

position of the activity of production, exploration and development, consulting and service-supply were the two other important fields of operation of small firms with, respectively, 26 and 22 percentage shares. Altogether the share of the first three activities in the total amounted to 82 percent as there were 558 enterprises in these domains of the small business.

We note from Table 1.9 that some 67 percent of the total number of small firms in the oil and gas industry in Canada were domiciled, by headquarters, in Calgary. Apparently, Calgary was the largest single point of concentration of the industry's small business in this country with 460 units. And the Province of Alberta hosted 587 small enterprises or 86 percent of the Canadian total.

The small firm sector in the Alberta oil and gas industry

Table 1.10 reveals that the 587 small firms, which were located by headquarters in Alberta, were engaged foremost in production, exploration and development of fossil energy. Thirty-two percent of the total number of these units were in this field. A close runner-up was consulting with a 27 percentage share followed by service and supply enterprises with 22 percent. It is notable that the presence of small enterprises in all the remaining fields was conspicuously low, perhaps with the exception of group 13 (transportation and oil field construction) where some 6 percent of the total number of small Alberta firms were operating. It transpires, a larger proportion of mini-small, than of maxi-small firms, was active in the field of production,

Table 1.11

Distribution of small firms by headquarter location, the oil and gas industry, Alberta, 1977-78

Location	Number of firms and percentages the mini-firm		the maxi-firm		Total number of small firms	%
Calgary	335	84.0	125	66.5	460	78.4
Edmonton	33	8.3	28	14.9	61	10.4
Other Alberta	31	7.8	35	18.6	66	11.2
Totals and	399	100.0	188	100.0	587	100.0
Percentages	68.0		32.0		100.0	

Source: See Table 1.1.

Table 1.12

Organizational links, small firms, by groups of activities,

the oil and gas industry, Alberta, 1977-78

Groups of Activities	(1) Affiliates	%	(2) Controllers	%	(3) Affiliates-Controllers	%	(4) Totals (1)&(2)	(5) Industry totals	(1), (2) and (3) as percentages of (5) (1)	(2)	(3)
1.	52	40.6	43	97.7	5	83.3	95	188	27.7	22.9	2.6
2.	40	31.2	1	2.3	1	16.7	41	128	31.2	0.8	0.8
3.	16	12.5	-	-	-	-	16	160	10.0	-	-
4.	-	-	-	-	-	-	-	9	-	-	-
5.	-	-	-	-	-	-	-	6	-	-	-
6.	-	-	-	-	-	-	-	4	-	-	-
7.	3	2.3	-	-	-	-	3	8	37.5	-	-
8.	6	4.7	-	-	-	-	6	23	26.1	-	-
9.	1	0.8	-	-	-	-	1	2	50.0	-	-
10.	2	1.6	-	-	-	-	2	14	14.3	-	-
11.	1	0.8	-	-	-	-	1	4	25.0	-	-
12.	5	3.9	-	-	-	-	5	8	62.5	-	-
13.	2	1.6	-	-	-	-	2	33	6.1	-	-
Totals and Percentages	128	100.0	44	100.0		100.0	172	587			
	74.4		25.6				100.0				
					6			1.0			
	21.8		7.5					29.3			

Source: See Table 1.1

exploration and development of oil and gas (36 percent). Similarly, with consulting. But in the field of service and supply this situation was reversed.

According to Table 1.11, 78 percent of the 587 small Albertan petroleum firms were located in Calgary. Edmonton and "Other Alberta" shared, respectively, 10 and 11 percent of the provincial total. As seen, Calgary also hosted a dramatically larger proportion of both mini-small firms (84 percent of their provincial total) and of maxi-small firms (66 percent) than Edmonton and "Other Alberta" did.[10] It follows that in Calgary the mini-small firm dominated the small business sector.[11]

Tables 1.12 to 1.16 examine inter-firm organizational linkages in the oil and gas industry in Alberta. Inter alia, the statistics throw light on the extent to which small firms were making their decisions independently. Small businesses are commonly referred to in the industry as "independents" and it is generally perceived that they are managed by their owners without any outside control. We would thus expect that this group of enterprises would be characterized by an absence of inter-firm organizational links. This, however, does not appear to be the case.

Table 1.12 documents the finding that out of a total of 587 small firms, 128 units, or nearly 22 percent, were in fact affiliated. These enterprises were thus subject to some control of other firms in their decision-making processes. It is also conspicuous that 44 units, or 7 percent of the total, exercised some kind of control over one or more other, presumably, smaller firms. And there were

Table 1.13

Organizational links, mini-small firms, by groups of activities, the oil and gas industry, Alberta, 1977-78

Groups of activities	(1) Affiliates	%	(2) Controllers	%	(3) Affiliates-Controllers	%	(4) Totals (1)&(2)	(5) Industry Totals	(1), (2) and (3) as percentages of (5) (1)	(2)	(3)
1.	37	43.5	31	96.9	4	80.0	72	145	25.5	21.4	2.8
2.	25	29.4	1	3.1	1	20.0	27	68	36.2	1.5	1.5
3.	9	10.6	-	-	-	-	9	131	0.8	-	-
4.	-	-	-	-	-	-	-	6	-	-	-
5.	-	-	-	-	-	-	-	3	-	-	-
6.	-	-	-	-	-	-	-	2	-	-	-
7.	2	2.3	-	-	-	-	2	3	66.7	-	-
8.	6	7.1	-	-	-	-	6	20	30.0	-	-
9.	-	-	-	-	-	-	-	1	-	-	-
10.	2	2.3	-	-	-	-	2	8	25.0	-	-
11.	2	2.3	-	-	-	-	2	2	100.0	-	-
12.	1	1.2	-	-	-	-	1	3	33.3	-	-
13.	1	1.2	-	-	-	-	1	7	14.3	-	-
Totals and	85	100.0	32	100.0		100.0	117	399			
Percentages	72.6		27.3				100.0				
					5			1.2			
	21.3		8.0					29.3			

Source: See Table 1.1

Table 1.14

Organizational links, maxi-small firms, by groups of activities, the oil and gas industry, Alberta, 1977-78

Groups of activities	(1) Affiliates	%	(2) Controllers	%	(3) Affiliates-Controllers	%	(4) Totals (1)&(2)	(5) Industry Totals	(1), (2) and (3) as percentages of (5) (1)	(2)	(3)
1.	15	34.9	12	100.0	1	100.0	27	43	34.9	27.9	2.3
2.	15	34.9	-	-	-	-	15	60	25.0	-	-
3.	7	16.3	-	-	-	-	7	29	24.1	-	-
4.	-	-	-	-	-	-	-	3	-	-	-
5.	1	2.3	-	-	-	-	1	3	33.3	-	-
6.	-	-	-	-	-	-	-	2	-	-	-
7.	-	-	-	-	-	-	-	5	-	-	-
8.	-	-	-	-	-	-	-	3	-	-	-
9.	1	2.3	-	-	-	-	1	1	100.0	-	-
10.	-	-	-	-	-	-	-	6	-	-	-
11.	-	-	-	-	-	-	-	1	-	-	-
12.	3	7.0	-	-	-	-	3	6	50.0	-	-
13.	1	2.3	-	-	-	-	1	26	3.8	-	-
Totals and	43	100.0	12	100.0		100.0	55	188			
Percentages	78.2		21.8				100.0				
					1			0.5			
	22.9		6.4					29.3			

Source: See Table 1.1

altogether 6 units which acted as affiliates-controllers.

In some groups of activities, affiliation and control were an important element. Almost 28 percent of the total number (188) of "independent" producers, explorers and developers were affiliated and 23 percent were controlling other firms. The former percentage is even higher (31 percent) for supply and service units. The corresponding statistics for a few other groups are impressive, the highest being for refiners, processors, marketers and plant operators (group 12), where the relevant percentage was as high as 62. However, these groups are numerically small and the results obtained for them are not readily comparable with those for large groups of firms.

We may, therefore, conclude that the small firm sector does not lead an entirely independent life, rather it is subject to a fairly extensive and complex pattern of inter-firm organizational linkages.

To gain further insights into this issue, we compiled the relevant statistical information separately for the two subsets of the small firm sector, that is, the maxi-small and the mini-small firm. The data are presented in Tables 1.13 and 1.14. Of special interest is the former table because it supplies the relevant information on the smallest unit that has been investigated in the present study.

We observe that, even at this tiny size, affiliation was a fairly common occurrence. In effect, one-fifth of the 399 mini-small firms were affiliated, 8 percent acted as controllers and 1 percent were affiliates-controllers. In some groups the degree of interlocks among firms was quite marked. Thus, for groups 1 and 2 the percentages

of the individual group totals for affiliates were, respectively, 25 and 36. And for some (numerically small) groups these percentages were much higher - 67 and 100 percent respectively, for geophysical and exploration drilling contractors and for pipeline companies and power distributors.

We find that being a small firm, even the smallest unit in the industry (some of the mini-small firms were one-man businesses) does not necessarily mean that always entirely independent decisions will be made. The complex nature of operations in the oil and gas industry explains this phenomenon.

A comparison of Tables 1.13 and 1.14 reveals the similarities and differences in the pattern of inter-firm linkages between the 399 mini-small firms and the 188 maxi-small firms. For these two subsets of the small business, the percentages of the respective industry totals accounted for by affiliates and controllers, taken together, are the same (29). However, the maxi-small firms had a somewhat greater proportion of affiliates (23 percent of the total of their number) than the mini-small firms had (21 percent). But the latter group recorded a larger proportion of controllers. Also the proportion of affiliates-controllers was larger among the mini-small firms. As a further scrutiny of the relevant data will reveal, other differences as well existed between the two groups, especially with regard to the distribution of the three different forms of organizational ties as per individual groups of activities.

Table 1.15 presents the data on the network of inter-firm links

Table 1.15

Organizational links, "large" firms, by groups of activities

the oil and gas industry, Alberta, 1977-78

Groups of activities	(1) Affiliates	%	(2) Controllers	%	(3) Affiliates-Controllers	%	(4) Totals (1)&(2)	(5) Industry Totals	(1), (2) and (3) as percentages of (5) (1)	(2)	(3)
1.	62	22.5	59	81.9	33	78.5	121	130	47.7	45.3	25.4
2.	66	24.0	2	2.8	2	4.8	68	118	55.9	1.7	1.7
3.	30	10.9	-	-	-	-	30	78	38.5	-	-
4.	15	5.4	-	-	-	-	15	35	42.8	-	-
5.	18	6.5	-	-	-	-	18	39	46.1	-	-
6.	-	-	-	-	-	-	-	1	-	-	-
7.	13	4.7	-	-	-	-	13	22	59.1	-	-
8.	2	0.7	-	-	-	-	2	7	28.6	-	-
9.	16	5.8	-	-	-	-	16	40	40.0	-	-
10.	4	1.4	-	-	-	-	4	29	13.8	-	-
11.	18	6.5	8	11.1	6	14.3	26	31	58.1	25.8	19.3
12.	8	2.9	1	1.4	1	2.4	9	20	40.0	5.0	5.0
13.	23	8.4	2	2.8	-	-	25	120	19.2	1.7	-
Totals and	275	100.0	72	100.0		100.0	347	670			
Percentages	79.2		20.8				100.0				
					42			6.3			
	41.0		10.7					51.7			

Source: See Table 1.1

for the group of 670 "large" firms in Alberta. These firms employed more than 10 persons per firm. We observe that a larger proportion (58 percent) of the total of these firms, than that of our small firms (30 percent), were affiliates, controllers and affiliates-controllers.

Inter-firm organizational links in the oil and gas industry

In order to facilitate a comparison of our findings concerning the issue of inter-firm linkages, Table 16 reproduces the data from our previous tables for Canada and Alberta and for different groups of firms that have been studied. It will be kept in mind that the statistics for different subsets are not strictly comparable with each other. The table shows, for each of the six subsets, first, the percentages that affiliates, controllers and affiliates-controllers represented of the totals of individual activity groups (columns 1-13) and, second, the percentages that the totals of each of the above three categories of organizational links represented of the totals of the firms investigated (column 14).

It is seen that the totals of affiliates, controllers and affiliates-controllers for the small firms (subset 4) represented, in general, lower percentages of the corresponding totals of the firms investigated, than was the case with the "large" firms (subset 1) and the firms of all sizes (subsets 2 and 3). Thus, whereas the percentage in question for affiliates was 41 for the 670 "large" firms, it was 21 for the 587 small firms. And the corresponding percentages

Table 1.16

Organizational links, by groups of activities, Canada and Alberta, the oil and gas industry, 1977-78

roups of Activities	Averages		1	2	3	4	5	6	7	8	9	10	11	12	13	14	
1) Alberta (Table 1.15)	37.7	A	47.7	55.9	38.5	42.8	46.1	-	59.1	28.6	40.0	13.8	58.1	40.0	19.2	I	41.0
670 large firms.	6.1	C	45.3	1.7	-	-	-	-	-	-	-	-	25.8	5.0	1.7	II	10.7
	3.9	A-C	25.4	1.7	-	-	-	-	-	-	-	-	19.3	5.0	-	III	6.3
2) Canada (Tables 1.5	31.8	A	38.0	39.8	16.1	19.0	33.8	18.2	50.0	18.2	35.3	19.6	54.8	53.4	18.0	I	32.5
2056 firms of all	4.7	C	27.1	0.9	1.2	-	-	-	-	-	-	-	29.0	1.7	1.0	II	10.4
sizes	1.0	A-C	11.4	0.7	-	-	-	-	-	-	-	16.1	1.6	-	-	III	4.4
3) Alberta (Table 1.6)	30.1	A	38.8	37.3	14.2	20.0	36.8	11.1	48.5	17.4	35.5	19.1	52.5	44.8	15.8	I	30.6
1628 firms of all	4.1	C	25.9	0.9	1.0	-	-	-	-	-	-	-	20.0	3.4	1.8	II	9.0
sizes	1.4	A-C	9.4	0.6	-	-	-	-	-	-	-	-	5.0	3.4	-	III	3.2
4) Alberta (Table 1.12)	22.4	A	27.7	31.2	10.0	-	-	-	37.5	26.1	50.0	14.3	25.0	62.5	6.1	I	21.8
587 small firms	1.8	C	22.9	0.8	-	-	-	-	-	-	-	-	-	-	-	II	7.5
		A-C	2.6	0.8	-	-	-	-	-	-	-	-	-	-	-	III	1.0
5) Alberta (Table 1.14)	20.8	A	34.9	25.0	24.1	-	33.3	-	-	-	100.0	-	-	50.0	3.8	I	22.9
188 maxi-small firms	2.1	C	27.9	-	-	-	-	-	-	-	-	-	-	-	-	II	6.4
	0.3	A-C	2.3	-	-	-	-	-	-	-	-	-	-	-	-	III	0.5
6) Alberta (Table 1.13)	25.6	A	25.5	36.8	0.8	-	-	-	66.7	30.0	-	25.0	100.0	33.3	14.3	I	21.2
399 mini-small firms	1.8	C	21.4	1.5	-	-	-	-	-	-	-	-	-	-	-	II	8.0
	0.3	A-C	2.8	1.5	-	-	-	-	-	-	-	-	-	-	-	III	1.2

Percentages of totals of activity groups

Note: A - affiliates.
C - controllers.
A-C - affiliates-controllers.

Percentages of total number of firms investigated

I - affiliates.
II - controllers.
III - affiliates-controllers.

Source: See Table 1.1

for controllers and affiliates-controllers were, respectively, 10.7 and 7.5 and 6.3 and 1.0. On the above evidence, it would appear that the importance of inter-firm organizational links rises with size of firms. However, these interdependencies do not vanish at the level of the mini-small firm. Rather, as indicated earlier, they appear to be of some significance.

In some activities the smallest firms actually registered a higher importance of a particular inter-link than did large units. For example, for groups of activities 7, 8 and 10, the mini-small firms recorded higher percentages of affiliates than the groups of larger firms did. In one instance, activity 11, this percentage was 100, however, only two firms were involved.

The average percentages for the 13 groups of activities for the six subsets of firms are a handy, though crude, way of presenting the results. Expectedly, the "large" firms recorded the highest averages for the three links. This group of firms represents, most likely, the largest firms of all the groups shown in the table. Although subsets 2 and 3 contain larger firms than our "large" firms do, they also contain very many small firms, whereas the "large" firms comprise no small firms at all.

It is seen that while the average percentage for affiliates was 38 for the "large" firms it was lower for all the other subsets, being lowest for the maxi-small firms. Similarly, the corresponding percentages for controllers and affiliates-controllers were invariably higher for the group of the "large" firms. This evidence confirms our

general finding that the matrix of organizational interlocks among oil and gas firms grows more complex and more extended as size of firms increase.[12]

The position of the small firm sector in the Alberta oil and gas industry

We were unable to obtain a satisfactory answer to the important question of how has been the position of the small firm sector changing over time in the industry. The Bolton Report[13] found that the small firm sector in the United Kingdom has been declining. Rein Peterson[14] provided some evidence to indicate that in Canadian manufacturing the owner-managed business has been declining relative to big business and professionally-managed subsidiaries.

We used the information provided by the Key Contacts Directory Ltd. (Calgary) to estimate the numerical importance of small firms in the Calgary oil and gas industry.[15] We compared statistics on the small firm sector for two years, that is, 1966 and 1977. Our findings indicate that whereas in 1966 small firms represented 58.4 percent of the total number of oil and gas businesses in Calgary, in 1977 these units accounted for 66.5 percent of the total. It would thus appear, on the above limited evidence, that numerical importance of the small firm sector in Calgary has been increasing over time.[16] If this finding is true, it would suggest, inter alia, that the growing petroleum industry in Calgary has become increasingly diversified functionally, perhaps, as a result of new technologies, and, in consequence, additional jobs are being performed by small businesses,

so that the relative numerical importance of the small business has been rising.

It would appear that the rate of failure of small oil and gas businesses in the 1970's has been moderate by comparison with that in other industries. Due to the paucity or unavailability of the required statistics we have not been able to come out with definite results concerning this issue.[17]

Footnotes for Section 1

1. Our data are in terms of employment per firm, not employment per establishment. A small firm is usually the same thing as a small establishment. But larger companies can operate several establishments.

2. C.O. Nickle Publications Co. Ltd., Calgary.

3. This classification was adopted from the Nickle's Register.

4. The employment data recorded in the Register were at times inaccurate. It would appear that, when the information on employment was collected for the Register, some respondents recorded the management employment only while others recorded the total employment of the firm, including its management. We often found that the actual employment of a firm was larger than that recorded in the Register.

5. Canadian Statistical Review, Statistics Canada, September, 1978 (Annual average employment for 1977.)

6. The massive concentration of oil companies and petroleum-related enterprises has for years lubricated and fueled Calgary's economy. The oil industry is its major and vital component. Some quantitative evaluations of the importance of the industry in the city are given in the following sources: Let's Look at Calgary, Calgary Chamber of Commerce, 1978; Calgary Business Guide, Department of Business Development, City of Calgary, 1977; Trade and Commerce Magazine, November, December, 1976 and The City of Calgary, Industrial Development Department, July, 1977.

7. For some important features of the 50 largest petroleum companies who have established their Canadian head offices in Calgary, see, Canadian Petroleum, November, 1978.

8. Petroleum industry linkages in Alberta were examined by G.H. Zieber, in "Dispersed City Hypothesis with Reference to Calgary and Edmonton," The Alberta Geographer, No. 9, 1973, Department of Geography, The University of Alberta, Edmonton. The need for organizational links and contacts between the companies residing in Edmonton and Calgary arises from joint ventures, unitization and other common activities. (Field unitization is an arrangement whereby wells in a field are operated under a common management which permits the application of good engineering practices in the entire field.)

9. Canadian Statistical Review, Statistics Canada, September, 1978 (Annual average employment for 1977).

10. Calgary and Edmonton perform essentially different functions. While Calgary is an oil administrative centre, Edmonton has the major supply houses and stores, machine shops and manufacturers of

oilfield equipment. Edmonton is also becoming an important refining and petrochemical centre whereas Calgary is loosing its position in this respect. See, G.H. Zieber, op. cit., and "Inter- and Intra-City Location Patterns of Oil Offices in Calgary and Edmonton, 1950-1970," unpublished Ph.D. Thesis, University of Alberta, Edmonton, 1971. See, also, W.L. Grossman, "Calgary Remains a Gas, Oil Centre?" in Onward Calgary, Vol. 3, No. 2, March-April, 1972.

11. For a discussion of Calgary and Edmonton as the two leading centres of the Canadian petroleum industry, see, G.H. Zieber, "Calgary as an Oil Administrative and Oil Operations Centre," in Brenton M. Barr (ed.), Calgary, Metropolitan Structure and Influence, Western Geographical Series, Vol. 11, Department of Geography, University of Victoria, 1975.

12. Report of the Royal Commission on Corporate Concentration, Minister of Supply and Services, Canada, 1978, Study No. 20 (D.G. McFetridge and L.J. Weatherley, March, 1977) deals with the issue of linkages between corporate entities. See, also, Statistics Canada, Inter-corporate Ownership, 1972, Cat. No. 61-513, November, 1974.

13. Report of the Committee of Inquiry on Small Firms, HMSO, Cmnd 4811, London, 1972 (known as the Bolton Report), chs. 5, 6 and 7.

14. Rein Peterson, Small Business: Building a Balanced Economy, Press Percépic, 1977, pp. 73 and 74 (Table 6). See, also, "Small Business Share is Getting Smaller and Smaller," Financial Times of Canada, July 7, 1975.

15. The statistics were prepared by Ms. Janice Cheslak, industrial economist with Foster Research Centre, Calgary.

16. The result must be interpreted with great care. All the registers of business, at present available in Alberta, suffer from serious shortcomings when intertemporary comparisons of the data provided are made. The employment class-intervals are different for different periods of time; a large proportion of firms do not provide employment statistics and, finally, many firms which have only limited dealings with the oil and gas industry are recorded.

17. Dun and Bradstreet's data of business bankruptcies are too aggregate for the purpose of a study of business failures of small firms in the oil and gas industry. Similarly the Alberta Supreme Court Bankruptcy Registrar's Office's files do not specifically detail small firms in this industry that have bankrupted in Alberta. A special research would be required to extract the necessary information from the available documents. See, however, an interesting article: "Easy Credit, Poor Management Boosting Alberta Bankruptcies," The Calgary Herald, September 12, 1977.

SECTION 2

THE SMALL FIRM IN THE ALBERTAN PETROLEUM INDUSTRY: AN EMPIRICAL AND ANALYTICAL SETTING.

In this Section we will examine the reasons for the existence of small firms, the circumstances which explain why they grow into large corporations and the principal behaviouristic and other features of small and large firms. The answers to these issues will enable us to place the small firm sector in the petroleum industry in its proper perspective.

The concept of the small business

The statistical measures of the size of firm by employment, sales, expenditures and assets permit us to count the number of firms of particular sizes. In Section 1, using employment as a measuring rod of size, we counted 587 small enterprises in Alberta in 1977-78. At the other end of the spectrum there were giant corporations. If we define such an enterprise as one which employs more than 1,000 persons, there were 14 such corporations in Alberta.[1] They accounted for 1.1 percent of the total number of firms in the industry (see Table 1.4). By virtue of our (arbitrary) definition of the giant corporation, the remaining 656 Albertan firms were either intermediate-size or large-size businesses.

In the economic theory of the competitive firm, a small firm, first, accounts for a small share of the total market for its output. Clearly, this criterion creates a problem because if the market were

a large one, the statement could also be true for a "large" firm. Second, it is managed personally by its owners. Third, it is independent in the sense that its management is free from outside control in taking principal decisions.[2]

The information that was available to us on the population of firms in the oil and gas industry did not permit us to devise a statistical concept of the small firm such as would closely parallel its theoretical definition. Rather, a crude and arbitrary definition was adopted - we used employment per firm. This measure does not adequately capture changes in the stock of physical capital and the changing use of the existing stock. In effect, it underrates the size of capital-intensive units and overestimates that of labour-intensive ones.

The Bolton Report defined the small firm in manufacturing in terms of employment.[3] Wert defined the small business firm as employing total long term capital of less than a critical value.[4] Hollander et al. asserted that neither amount of assets, nor volume of sales, nor number of employees alone can define small business. In their view, any business is small as long as its owners "choose, operate, and manage the business, make the essential decisions and retain the rewards and bear the losses of their risk-taking and management."[5]

Functions of the small business

The evidence of Section 1 indicates that small firms tend to dominate numerically those areas of activities where outputs are unstandardized and geographically dispersed; in which personal attention and original and genuine knowledge is necessary; and in which a rare and

specialized know-how plays a crucial role. It is conspicuous that the minors operated in all the thirteen aggregate groups of activities that were investigated. By the same token, there were no exclusive domains of the industry's majors.

This ubiquitous presence of the small firm in the industry is explained by the fact that the small enterprise carries out functions which it can perform more efficiently than larger firms. To put it differently, given the highly diversified productive processes in the industry, the small business performs those tasks which cannot be efficiently performed on a large scale.[6] Again, large corporations often find it simply uneconomical and inexpedient to allocate their resources to particular tasks, the performance of which they leave to small units. Finally, large businesses may not possess the required specialized know-how which small firms command.

Although, due to their small size, small businesses do not benefit from the economies of scale directly, nonetheless, they employ techniques which result in such economies. Small firms in the oil and gas industry enjoy the economies of scale through the medium of consortia which engage in joint marketing, purchasing and investment, farm-outs, participation agreements, operating agreements, pooling agreements, unitization, partnerships, associations and syndicates.[7] Many small firms may be involved in these ventures and substantial production economies may accrue to the individual participants. It would appear that the various arrangements are quite common in the industry.

Furthermore, small firms benefit from the economies of specialization which are not readily accessible to large units. First, small

enterprises may be independent specialists who concentrate on the production of one, or a few closely related outputs, which they market to other minors or majors. The independent specialist may achieve considerable cost reductions which may compensate for the absence of the economies of scale. Next, small businesses operate as satellites of large firms. They are specialists but most, if not all, of their output is taken by a large firm on a subcontract basis. In rare instances, the large firm may design the product for the satellite. Like the independent specialist, the satellite may achieve a very high level of efficiency-use of its resources due to the economies which flow from mere specialization. Finally, small firms may compete (market competitors) with large corporations by producing identical or similar outputs. Typically, a very small business earns its profit in the shadow of a giant corporation in the same market. Par excellence example is the small explorer-exploiter-developer of oil and gas.

We turn now to a brief survey of the bewildering spectrum of activities of the small enterprise.

To start with, this unit is an important numerical participant in exploration, drilling and well-development. This field happens to be the mainstay of the industry's largest corporations. The minors often perform the relevant tasks for large firms through subcontracting. We were not in position to ascertain what proportion of the total exploration, drilling and development is carried out by the small subcontractor but this proportion would appear to be important - in drilling in Alberta it may be as high as 70 percent. The small firm also acts as an independent explorer-driller-developer entirely in its

own right.

Many minors provide a comprehensive turnkey package of personnel services on the well-site. The service comprises housing or camping accommodations for the crew and all the other living paraphernalia.

A large amount of the essential technical well services and equipment for drilling operations is supplied by small firms. They provide drilling rigs and are builders of rigs, frequently coming up with improved designs. A small sample will illustrate the variety and sophistication of these outputs: Workover, reworks, completions, maintenance, and supervising of well operations; chemical corrosion control; shothole cementing; power casing and tubing; oil well logging and perforating; turnkey oil field construction; oil field hauling; oil field stimulation; sandblasting; grading; drilling out; dewaxing; swabbing; running and pulling bottom hole chocks; pressure tests; pipe yards and storage space; pipe maintenance; and fire and blow-out prevention.

Another field where small firms predominate numerically, and where new services are frequently introduced, is that of consulting.[8] This service is admirably suited for the operations of very small firms. For, by its very nature, the output may be highly specialized and often deals with nonrepetitive situations. Since consulting, in general, is not a capital-intensive activity, there is scope and inducement for small firms to enter this field. Again, but a few examples will be given to project the multiplicity and variety of these services: oil exploration, production, management and investment consultation; legal and oilfield surveys; professional petroleum engineering; aeromagnetic

interpretation and supervision; seismic gravity and magnetic modelling; arctic technical resource management services; economic studies, financial and impact services; geology, palynology and micropleotology; regional stratigraphy; gas and oil prospect appraisals and development; offshore and onshore drilling; drilling and corrosion monitoring and analysis; petroleum and natural gas exploratory land evaluations; appraisal of wildcat acreage holdings or tracts; land services for mergers, sales and acquisitions; regional mapping; facies mapping; prospect generation; equipment and machine design; geochemical; design and implementation of exploration programs; water quality; and wellsite and field supervision, including drilling, completions, workovers, production installation, waterflood installations and lease operating.

The highly diversified consulting services embody an amazing amount of advanced technological knowledge, especially, of seismic information.*

Whereas large corporations may employ their own data processors and analysts, the rest of the industry relies on the services of small specialists in this area. The advent of modern computing methods and the increasing reliance of the industry on data processing and analysis[9] has been generating a strong demand for these services. They comprise such activities as development of geophysical and computer software packages and custom programs; computer hardware services; computerized data files; microfiche data files; well-log libraries; programming information; retrieval and exploration data systems; geophysical brokerage; seismic data sales and processing; computerized financial accounting; and land record systems.

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* We understand there is a multi-billion dollar stock of seismic information in Calgary and that the trade in it is the largest of all in the city.

And one more example, by no means the least or the last, of the services provided by the small firm sector - a comprehensive package of office services. We understand this is a relatively new service. Prior to its introduction, a company which was about to establish an office in Calgary or Edmonton would use various roundabout methods for this purpose. This was inconvenient, costly and the end-product not always satisfactory. Today, a firm offering a package of office services obtains all the preferences of the newcomer concerning the location, size and other details of the future office. Then it rents the required office space, decorates it, furnishes it and provides it with all the equipment. Even the secretarial personnel may be hired and the housing for the officials provided.

The position of the small firm in the industry

The operations of the small firm sector must be related to the working of the industry as a whole. The technologically-oriented oil and gas industry consists of firms of various sizes which supplement and complement each other in an extremely complex and fragmented process of production. A balanced industrial structure of this type of co-existence and co-operation leads to the aggregate efficiency and flexibility.

In the oil and gas industry this type of balanced and efficient industrial community can be achieved by the operation of market forces. Hence, as we will argue later in this study, a liberation of these forces from interference by governments, and provision of adequate incentives, will ensure an environment which will be instrumental in

bringing about the balance in question. This is the best way of creating the most favourable conditions for an effective and smooth working of the industry. Other countries, for example, Japan, have achieved this objective already in other industries.[10] The discussion of the role of the small business has often drifted away from theoretical analysis into emotion-loaded argument. The small business has been acclaimed as "beautiful", "beautiful and more efficient", "better", "needed" and "necessary" and predictions have been made of the doom of the large corporation and the triumphs of the small enterprise in the future economy.[11] However, the simple truth of the matter is that the big business cannot operate without small businesses and that the free market forces will determine both the number of small units and the type of tasks that they will perform, by rewarding with profit the entrepreneurial talent and penalizing with losses the inefficient producer. If, for instance, the demand for an existing or new service or product rises either the existing firms will tend to expand their outputs or new firms will enter the industry, or both. The operation of the market mechanism will ensure an equilibrium number of small firms, and their rewards, at any point of time.[12]

Small firms supply other minors and majors with essential inputs, often with vital components without which the industry's productive mechanism could not work efficiently. The contribution that the small enterprise makes to the final output of the industry is a consideration of utmost relevance. Whereas the concept of the marginal product of the firm, in the conventional sense, has received a great deal of attention in the economic theory, that of the marginal contribution

that a small unit makes to the aggregate output of the industry deserves more emphasis than it has hitherto received. The network of production interdependencies between large and small firms and among small and large enterprises in the oil and gas industry is very striking, indeed. Furthermore, the importance of the small firm lies in the fact that it always has been a competitive force, a seedbed for new enterprise and entrepreneurial talent, a source of new life-blood and ideas and the breeding ground for future large corporations.

The interdependencies between large and small firms notwithstanding, the position of the large firm sector in the industry is unique. It may be credited with the overall initiation and organization of the industry; provision of the bulk of capital, especially high-risk capital; the basic technologies; and other "infrastructures" which, for various reasons, cannot be provided by the small firm sector which is subordinate to the large corporation sector. But the majors in the industry could not operate effectively without the assistance of many hundreds of small businesses. The extent to which small and large firms interdepend on each other is so important that the industry must be viewed as a community of producers who have common interests and common problems.

The coexistence of small and large firms and the growth of firms

We have seen that small firms are ubiquitous in the industry - they are maids of all trades and masters of many. We also noted in Section 1 that in each of the thirteen activities studied there were

large and small firms. To explain this finding we will rely very extensively on the analysis of the structure of the modern industry by Professor John Kenneth Galbraith.[13] The Galbraithean approach will also help us explain why some small firms grow into large corporations.

The distinction between the market and planned economy is important. The former is the habitat of the small firm and the latter that of the large corporation while the intermediate-size firm is in the process of transition from the market to the planned economy. In the "marketer" the decisions are made by the owners of capital but in the "planner" this authority rests with the organization of the corporation. Whereas in the market economy business tasks are performed by one individual (or a small consortium of individuals), in the planned economy they are performed by a team of technocrats (the technostructure). Organization thus substitutes the more specialized effort or knowledge of several or many individuals for that of one or few individuals. As the firms grows, the decisions become increasingly complex and must be made by ever larger groups of technocrats.

In those lines of production - of whatever nature they may be, even highly personalized services - where organization can be introduced, and the management is willing and able to implement it, large size production becomes possible, and vice versa. When organization is introduced, the firm will grow and will increasingly control markets and influence community attitudes and the government. The larger is the firm, the greater is the extent to which it can control and, therefore, plan its environment, hence, the "planned economy". When a line of production lends itself to organization there is no set upper limit to

the size of firm. Hence, organization is the key explanation of why there are firms of different sizes.[14]

In those activities where organization can be introduced, firms achieve large size operations through the adoption of new technologies. According to Professor Galbraith, the technostructure of the modern large corporation "goes hand in hand with technical progress."[15] Technology requires the knowledge of experts, specialists and technicians and this entails organization. To make technology work, capital is necessary and its management requires specialists, thus leading to additional organization. When the return on the employed capital tends to have a long period of gestation, the existing organization must be financed in the meantime and this means overhead costs. Technology, therefore, involves the costs of technocrats, capital and overheads which impose a limit on the size of firm. The above would explain why small firms tend to employ inexpensive technologies which they can acquire at a low cost. No substantive organization is necessary when such technologies are introduced. But large units can introduce costly technologies because they have the necessary technostructure and resources.[16] It follows that, first, there is an optimal size of firm which goes with a particular technology. If a new, and more costly technology, is introduced, the size of firm will increase and so will its organization. Second, to make successful its technology-induced growth, the firm must be increasingly able to control and, consequently, plan its environment. The larger the firm, the greater will be its influence on prices, costs, consumers, the community and the government.[17]

Contrasts between the small enterprise and the large corporation

We are now in position to sum up the principal structural and behaviouristic differences between small enterprises and large corporations, or the market and planned economy. The intermediate-size firm is in the process of transitting from the former to the latter economy. Its characteristics can easily be identified and are defined by the position it occupies between the two extremes of the spectrum, on the one hand, the small independently managed firm and, on the other, the mature corporation.

(1) The managers of marketers are independent entrepreneurs. Many had jobs with major companies prior to setting up their own business but they had found their work unsatisfactory. Consequently, they decided to manage their own businesses in which they can preserve the identity of their work and find free expression for their creativity. Professor Galbraith succinctly compared the small entrepreneur with an artist[18] and contended that "although technically less proficient, the small firm has, because of its small size, the advantage of superior art."[19] But no such element of art is present in the large corporation - it has been replaced by the technostructure.

(2) In the small business there is no need for disciplinary rules to ensure efficiency because the manager operates under an incentive system which rewards him for business ability and punishes him for ineptitude. And his employees benefit from personal supervision, consultation and advice. This environment may be more important than technical competence. Moreover, if the operator makes

an error of judgment it is his own capital that will be lost or diminished. Not surprisingly, the efficiency in small units may be as high, or higher, than it is in large enterprises.

By contrast, in the large planner, the discipline and organization are a sine-qua-non of operations. Hours of work are specified and a minimum expenditure of effort is enforced through formal supervision. More importantly, conformity is a major virtue which enables the organization man to ascend the echelon of authority. Consequently, individual enterprise may be stultified. The talent that the large corporation employs tend to be, foremost, accommodating because people work in accordance with established rules. The nonaccommodating talent often outmigrates to the small-firm sector where it adds to the extant stock of independent owner-managers.

The individual entrepreneur is not subject to any rules that limit his hours of work and the intensity of his effort. He thus commonly works longer hours, harder and more intelligently than his counterpart in a large corporation. In our interviews with business executives of small firms, we were told that the small firm sector is "a seven-days-a-week and eighteen-hours-a-day workplace." As a result, the owner-manager may conceivably offset the technical advantages that are enjoyed by the organization man. This consideration, in addition to those mentioned earlier, points to a high efficiency-use of resources in small enterprises.

However, the small entrepreneur by working longer hours and more intensively reduces his pecuniary compensation per unit of effort expended. In other words, he exploits his own labour, and so does his

wife, if she works with him, and his business associates. They all indulge in exploitation of their labour because, due to their relative lack of economic power, they are induced to work for less return than the industry generally pays for comparable effort. Most executives in the small firm sector are aware of this phenomenon. We were informed during interviews that the individuals believed they could get a higher salary with a major for the amount of work they were doing, or they could get an equivalent salary for less work and less intensive work. However, they trade-off more independence, and more interesting and challenging work, for less reward. As a result, the industry benefits because it does not pay the same monetary reward, for comparable work, to the executives of the minors, as it does to those of the majors.

(3) Another notable difference between the marketer and the planner lies in the objectives they endeavour to achieve. Subject to the constraint of his expertise, and in the environment in which he operates, the marketer strives at a maximum profit.

Small firms, which may be competitive, monopolistically-competitive (output differentiation is pervasive) or monopolistic (even a very small firm may be in a monopoly position) are highly interdependent on each other. Personal contacts with customers and suppliers are of crucial importance.[20] Even important deals are made on the word of mouth and credit is extended on the basis of mutual trust, the past business done, and the prospects for sustained and profitable future deals. Competition is friendly rather than cut-throat. As for prices, with the exception of those which are fixed

by the government or by large corporations, they are subject to agreements. The "take and give" rule prevails, mutual advantages are carefully weighted and new business is solicited. The price will depend, in addition, on whether the firm is establishing in the market or is an old concern, on the number of actual and potential competitors and whether the market is rising or falling.

Given this environment, which largely stems from the fact that small enterprises do not operate in isolation but are an integral part of the petroleum business community, the small entrepreneur at all times does his best to maximize his profit. At times profits may be abnormal, but as the existing firms will expand their outputs and new firms will be induced to enter the industry, this profit will soon be eliminated. This means that the small entrepreneur must constantly endeavour to make money. Professor Galbraith aptly pointed out that avarice is actually a necessity in a small firm.[21] Since earnings tend to be at the level that compensates the manager for his enterprise and capital, but leave him little or no surplus, they are not adequate for reinvestment purposes and the firm depends importantly on external capital. The situation is different in the planned economy because the technostructure exerts a powerful influence on prices, costs and consumers. In consequence, the large corporation does not depend on external sources of finance to the same extent as the small business does, because it can achieve abnormal profits and keep them abnormal.[22]

While the small enterprise always strives for a higher profit, the large corporation, once it has achieved an adequate level of profit, turns to growth which comes its central goal.[23] According to

Professor Galbraith, "the accepted economics is a remarkable barrier to understanding the most basic tendency of modern economic society."[24]

In order to safeguard its existence, the technostructure must discharge its obligations to stockholders and creditors and must minimize the external interference with its decisions by capital owners, workers, consumers and governments. The basic strategy by which it can protect its autonomy is to achieve a certain minimum level of earnings which also provides the corporation with a source of investment funds that is fully under its control. The technostructure thus does not view the service to the consumer as its ultimate objective, rather, the two purposes for which it uses its power are to protect its autonomy and to reward itself with growth.

(4) Whereas both the small enterprise and large corporation endeavour to affect control of their economic environment, they use different methods to accomplish this goal and they achieve a different degree of success.

The marketers act collectively. But voluntary collective action is easily weakened by dissent or indifference. As we noted earlier, small entrepreneurs work long and intensive hours, hence, even though they may see the need for political representation, they have little surfeit of time to participate actively in, or to support, their representative bodies. In consequence, the collective efforts of small firms tend to be somewhat ineffective. In general, legislators do not readily respond to the demands of representative bodies.[25]

In contrast, the large corporation wins control over its environment merely by virtue of its size. And if it cannot succeed in

controlling costs, it is in position to pass increased costs via the price vehicle on to the market. When government assistance is required the approach of the large corporation is not to the legislature but to the bureaucracy which is more powerful and, therefore, more effective. There is, indeed, a symbiotic relation between the two organizations but no such relationship is possible between the bureaucracy and the representative bodies of small firms. As a result, it is the planned economy that succeeds in controlling its environment.

(5) Whereas, the planning system is able to manipulate its environment, the market system is subordinate to its own environment, an important part of which is actually the planning system. Moreover, the market system is a subsidiary and supporting development of the planning system. In effect, the developments in the former, such as changes in the rate of activity, inflation and unemployment, are significantly influenced by what happens in the latter.

The planning system provides organization, capital and many infrastructures which are used by the market economy. An important one is innovation. As discussed earlier, most innovations require capital to cover the period of development and gestation of its returns. This capital is beyond the means of the market economy which also lacks the specialized technical and scientific resources and the organization which modern technical development requires.[26] According to Professor Galbraith, very few important technical developments in recent times have been the product of an individual inventor in the market system. While individuals have inventive ideas, very seldom can they bring ideas into use. "Innovation in the market system remains important

mostly in the minds of those who cannot believe the small entrepreneur ever fails."[27] In addition to providing infrastructures, the planned economy supplies a large share of the inputs that the market system purchases and it is an important purchaser of the outputs of the market system. However, while the market system buys at prices of goods and services, and of labour, which are largely controlled by the planning system, at the same time, an important proportion of its output is sold at prices which it does not control but which may be controlled by the planning system. The consequences of this imbalance of market power are predictable: The terms of trade will tend to favour the planned economy which controls prices and costs and, thereby, the prices and costs of the market economy and the planned economy will enjoy a relatively more secure and favourable income than the market economy.

(6) While the planned system in the petroleum industry is owned and controlled to a very high degree by foreign, mainly U.S., capital,[28] the participation of Canadian capital in the market system, especially in very small enterprises, is very significant, and, apparently, growing.

This imbalance of ownership by nationality is easily explained. When the oil and gas industry was developed during the early post-war period the type of capital that was required was not readily available in Alberta. To carry out developments in this industry, high-risk, long return-gestation and large volume capital was required. Also, an organization at a high level of technostructure was necessary to make use of it. The suppliers of it to Alberta were multi-national corporations through their subsidiaries. Once they gained a foothold in the

province the rest has followed: both the number of new foreign-controlled subsidiaries has increased and the original affiliates have extended their operations.

The establishment of the foreign technostructure in Alberta, and its subsequent growth, has generated a market system. But the type of capital that is used by the marketer is different from that used by the large corporation in the industry. First, while it may be at high risk, mostly, it is not. Second, a small amount of capital is often sufficient though it may not be adequate. Third, the return on it, with a notable exception of exploration, matures in a relatively short time. It is this type of capital that has been available in Canada and which, incidentally, has been outmigrating abroad. However, some of it has found its way into the Alberta oil and gas, not that special fiscal incentives were given to it to go into the industry. Conspicuously, in the United States generous incentives to petroleum exploration have been in operation for a long time and, paradoxically, the U.S. investor was coming to Alberta with a "60 cent dollar" while its Canadian counterpart had to use a "80 cent dollar". It would appear that the Canadian tax system discriminated against the Canadian investor and, consequently, Canadian ownership has not been encouraged.

The Canadian investor is now an important participant in the small firm sector of the industry. Our impression is that there is no shortage of entrepreneurs in this province. Appropriate fiscal incentives and a favourable climate would elicit an additional supply of the entrepreneurial talent thus strengthening the position of the Canadian owner and controlled capital.

All this seems to run counter to the conventional platitude and stereotype which has often been repeated by economic analysts and politicians, that there is a disturbing shortage of risk-capital and entrepreneurship in Canada.[29] This perception has been a recurrent theme in the literature dealing with the low efficiency performance of the Canadian manufacturing industries vis-à-vis the U.S. industries.[30] During the post-war period the search for a culprit has focussed on the Canadian tariff. Several studies have demonstrated that the effective tariff rates in Canada are mostly higher than those in the other developed industrial economies, and in the United States.[31] It has been asserted that the tariff protection acts as a disincentive to enterprise. The free trade proponents have argued, in consequence, that a reduction, or a removal of the Canadian tariff altogether would lead, after a period of adjustment, to a substantial improvement in the competitive stance of Canadian manufacturing.[32] This amounts to a recognition of the reality that there is no shortage of Canadian entrepreneurial talent. However, the tariff-ridden situation does not expose the Canadian entrepreneur to the international competition, on the contrary, his talent is kept dormant and unexploited. Such an exposure would, however, take full advantage of the existing potential. It transpires that the protective environment in which the manufacturing industries have been operating largely explains their relative low productivity plateau. In the meantime, the national syndrome that "Canadians are not entrepreneurs and that they have a risk-aversion" has had its heyday.

When an analyst examines the Alberta scenario he is struck by the high degree of foreign control and ownership and might be tempted to extend the national dictum to this industry. The explanation, however, appears to stem from the fact that the Canadian entrepreneur has been working at a distinct disadvantage by comparison with his foreign counterpart. In the circumstances, special, strong and permanent fiscal measures to stimulate the participation of Canadian capital would have been fully justified. They are a Johnny-come-lately, but already their favourable effects are apparent.

The importance of an adequate return on Canadian capital in small business cannot be easily overstressed because the small enterprise in the early years of its operation relies for reinvestment purposes on the returns it generates. An important aspect of the return that a small entrepreneur obtains on his operations is that his gross earnings embody the returns on his management capital, and labour. These returns are inseparable statistically and they may also be difficult to separate in the mind of the owner-manager. Whereas the annual financial statement of a large corporation identifies the payments to, each, capital, management and labour, the corresponding accounting rendering for a small enterprise does not exist. Clearly, the entrepreneur rightly expects that the return on his resources will come to more than just the return on capital in the industry as a whole. The present system of taxation would appear to pay only lip-service to this issue. The small businessman, in his capacity as owner, manager, investor, organizer, worker, inventor and innovator, though taxed at a lower rate on his total earnings than a larger enterprise, nonetheless, may be more severely taxed for the reasons just explained.

Notes for Section 2

1. According to our findings (see Table 1.1) there were 44 "giant" corporations in the Canadian oil and gas industry (they accounted for 2.8 percent of the corresponding total number of firms).

2. This definition closely follows that given by The Bolton Report, pp. 1-2.

3. The small firm in manufacturing was defined as employing less than 200 persons (The Bolton Report, Ch. 1, 1.9). For the statistical definition in that study of the small firm in other industries studied by the Committee, see, Ch. 1, Table 1.1.

4. James West, "Small Business Promoters - A Case Study of Columbus - Ohio," Journal of Industrial Economics, 1956, Vol. 1, pp. 45-50.

5. Edward D. Hollander and others, The Future of Small Business, A. Praeger, 1967, p. 5.
There has been a great proliferation of definitions of the small business. Rein Peterson (op. cit., p. 62) defines a small business concern as one which "is independently owned and managed. For statistical and policy making purposes, unless otherwise limited by specific regulations, a small business has at most five hundred employees." Joseph W. McGuide ("The Small Enterprise in Economics and Organizational Theory," Journal of Contemporary Economics, University of Washington, Seattle, Washington, Spring 1978) contends that ". . . a small business is a profit-oriented organization in which there can be rationally one profit center (the owner). . . . In the small firms, the entrepreneurial function, which is the individual identified with success or failure, is easily identifiable. . . ." The United States' Small Business Act (Public Law 85-536, U.S. Government Printing Office, Washington, D.C.) defines a small business concern as one which is ". . . independently owned and operated and which is not dominated in its field of operations." The Act specifies upper limits on the number of employees and the total dollar volume of sales for each industry group. The Canadian Federation of Independent Business defines a small business as one that is independently owned and operated, has a maximum of 500 employees and is not dominant in its field. See also, Eleanor J. Stockwell, "What is 'Small' Business?" in Financing Small Business, 1958 and Graham Banntock, The Smaller Business in Britain and Germany, Wilton House Publications, London, England, 1976. A descriptive study of 75 different national definitions of small business was carried out by the Georgia Institute of Technology in An International Compilation of Small Scale Industry Definitions, Industrial Development Division, Engineering Experiment Stations, Atlanta, Georgia, January, 1975. No two definitions were found to be exactly the same. However, the most common variable used for defining small business was the number of employees. Equally important criteria, used in most countries, were the size of total assets and the capital invested by owners. A similar study is

Definitions of Small and Medium Sized Enterprises and the Artisanat, Artisanat Division, April, 1976.

6. See, The Bolton Report, Ch. 3 (1).

7. See, R.D. Bell, "Business Arrangements in the Resource Industries," in 1972 Conference Report, Canadian Tax Foundation, 1973. See, also, "Consortia Bring Big Time Benefits to Small Firms," Financial Times of Canada, September 5, 1977.

8. For a detailed description of different branches of this service, see, The Consulting Industry in Alberta, 1977/78 (The Association of Professional Engineers, Geologists and Geophysicists of Alberta), Ministry of Business Development and Tourism, Alberta, July, 1977.

9. See, inter alia, Tom Kelly, "The Small Business Computer is going Gangbusters," Office Equipment and Methods, November, 1977; R.W. Rutherford, "Small Business and the Computer," Canada Commerce, September, 1975; and "Data Base Management for Small Business Computers," Business Quarterly, University of Western Ontario, Spring, 1977.

10. See, Rein Peterson, op. cit., pari passum and for a discussion of major impediments to the development of a vigorous and effective smaller business sector in the Canadian economy, see, Report of the Royal Commission on Corporate Concentration, pp. 408 ff.

11. A small sample of the literature in question will illustrate this point: E.F. Schumacher, Small is Beautiful: A study of Economics as if People Mattered, Abacus, 1974; Norman Macrae, "The Coming Entrepreneurial Revolution," The Economist, December 25, 1976; John Bulloch, "Small is Beautiful and more Efficient, Globe & Mail Report on Business, December 18, 1976; "Small is Necessary," Canadian Business Magazine, October, 1977; "Small is Better," Financial Post, September 24, 1976; but see also some countervailing ideas in, for example, "Japanese Zaibatsu:'Bigger may be Better'," Northern Miner, February 5, 1976 and Darcy McKeough, "Big Business Needed," Globe & Mail Report on Business, June 4, 1976.

12. For a discussion of the factors which determine the number of small firms in an industry, see, Hollander, et al., op. cit., pp. 16-18. See also, The Bolton Report, Ch. 4 (25), where it is stated that, "We do not know and we do not know how to discover whether or not the present number of small firms is adequate."

13. Especially, Economics and the Public Purpose, Houghton Mifflin, 1973 and American Capitalism, Houghton Mifflin, 1952.

14. "Small businesses involve all or most of the business functions and decisions concerning production, marketing, financing and managements; and do not exceed the size which, considering the nature of the business, permits personalized management in the hands of one or a few executives, as opposed to institutionalized management characteristic of larger enterprises." Edward D. Hollander, et al., pp. 4 and 5.

15. Economics and the Public Purpose, p. 39.

16. For an examination of the Galbraithean thesis that very large corporations are needed to produce the technical achievements on which economic progress depends, see, Edwin Mansfield, The Economics of Technological Change, W.W. Norton, 1968, Ch. 5, Section 22 and, the Report of the Royal Commission on Corporate Concentration, pp. 90 ff. See, also, Joseph Schumpeter, Capitalism, Socialism and Democracy, Harper and Row, 1942.

17. See, the Report of the Royal Commission on Corporate Concentration, Study No. 15 (The Existence and Exercise of Corporate Power) and Ch. 14 of the Final Report and John Kenneth Galbraith, The New Industrial State, Houghton Mifflin, 1961. See, also, E. Kierans, "Big Business Challenge to Government," Toronto Star, February 11, 1977.

18. Economics and the Public Purpose, p. 63.

19. Op. cit., loc. cit..

20. The following comment, made by a manager of a small business, well illustrates this situation: "I know most geophysicists in this city, most exploration managers and other people - you have to know the right people. You have to know whom to call. I can call now some 50 people without even looking at the telephone directory."

21. For a discussion of this point see, Economics and the Public Purpose, pp. 44 and 45.

22. Our findings in Section 7 of this Study indicate that smaller enterprises rely more importantly on external sources of capital than do larger corporations. High net earnings of large corporations are by far the most important source of reinvestment finance.

23. Rein Peterson (p. 88 and Table and Figure 7), using the data for the manufacturing corporations over the period 1961-1971 (Special Study, Corporation Statistics, Industry, Trade and Commerce, Ottawa) shows that the growth rate of large corporations exceeded the rate of growth in profits. F.X. Wildgen (Financing Small Business, Special Study for the Royal Commission on Banking and Finance, Ottawa, 1963, p. 42) reported that over the period 1950-1960 total assets of all manufacturing corporations increased by 13.2 percent while before tax profits increased by only 4 percent.

24. Economics and the Public Purpose, p. 83.

25. The Canadian Federation of Independent Business (President, John F. Bulloch) which has a voting membership of, approximately, 50,000 and whose central philosophy is the diffusion of power in all sectors (John F. Bulloch, "The Politics of Small Business," Inter-

national Symposium on Small Business, Washington, D.C., December 17, 1976) has been instrumental, inter alia, in influencing changes in taxation of small business, the Unemployment Act and the UIC. It can also be credited, to some extent, for the setting up of the Ministry of State for Small Business to the Ministry of Industry, Trade and Commerce. The Federation has been championing the cause of the small business for many years.

26. See, Richard Nelson, Merton Peck, and Edward Kalachek, "The Concentration of Research and Development in Large Firms," in Monopoly Power and Economic Performance, Edwin Mansfield (ed.), W.W. Norton, 1968.

27. Economics and the Public Purpose, p. 46.
"There is no more pleasant fiction than that technical change is the product of the matchless ingenuity of the small man forced by competition to employ his wits to better his neighbor. Unhappily it is a fiction. . . . A benign Providence has made the modern industry of a few large firms an almost perfect instrument for inducing technical change." (American Capitalism, p. 91).
See also, by the same author, "The Economics of Technical Development," in Monopoly Power and Economic Performance, Edwin Mansfield (ed.). Andrew H. Wilson, Science, Technology and Innovation, Special Study No. 8, Economic Council of Canada, May, 1968, pp. 84 and 85, states that, ". . . there are nowadays some areas of invention which are effectively closed to the majority of independent inventors. There are areas of growing scientific and technical complexity or of inherent empiricism in which intuition, 'flair', and ingenuity have to be supplemented with knowledge, experience, equipment, and financial resources. In these circumstances, it is not surprising that 'inventing' is becoming more of a company-based team work."

28. See, Report of the Royal Commission on Corporate Concentration, p. 191, Table 8.4.

29. Typically, "We tend to be terrified little men, clutching frantically at what we have and afraid to take any risk whatsoever even for large rewards. . . . If we are ever to become a great nation, we must overcome this disability." J.J. Brown, Ideas in Exile, MacClelland and Stewart, 1967, p. 340.

30. See, D.L. Daly, B.A. Keys, and E.J. Spence, Scale and Specialization in Canadian Manufacturing, Staff Study No. 21, Economic Council of Canada, 1968; P.K. Gorecki, Economies of Scale and Efficient Plant Size in Canadian Manufacturing Industries, Bureau of Competition Policy, 1977; and Judith Maxwell, Policy Review and Outlook, Howe Research Institute, 1976.

31. The earliest statistical study of the effective tariff in Canada was made by Bruce W. Wilkinson and James R. Melvin in Effective Protection in the Canadian Economy, Special Study No. 9, Economic Council

of Canada, 1968.

32. A seminal study of this problem is by R.J. Wonnacott and P. Wonnacott, Free Trade Between the United States and Canada, Harvard University Press, Cambridge, Mass., 1967.

SECTION 3

THE PRINCIPAL CHARACTERISTICS OF THE SMALL FIRM AND ITS MANAGEMENT

In this Section we will discuss some of the information we obtained during the interviews with the chief executives of small firms. Our questionnaire comprised 82 questions and it covered 26 different aspects of business operations.* We will presently examine the responses which elucidate the salient features of the small firm and the pertinent characteristics of its chief executives. The remaining interview material will be analyzed later in this study.

The sample of small firms

We took a sample of sixty small enterprises, all of them domiciled in Calgary.**

Table 3.1 gives the statistical information on their employment. Figure 3.1 is a graphic representation of Table 3.1. The sixty firms had a total employment of 275 persons; the median employment, 4 persons; and the mean employment, 4.6 persons. Seventeen independents, or 28 percent of the total, employed one or two people. Seven firms were one-person businesses and they represented 12 percent of the total. The mini-small firm, with 33 units, accounted for 55 percent.

The firms were also small in terms of the value of their assets, as shown in Table 3.2. Five firms had assets lower than $49,000 and three had assets larger than $10 million. The total assets of the group came to $147 million, the average value of assets being $2.4

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* See Appendix 5.
** See Appendix 1.

Table 3.1

Employment per firm

Persons employed	No. of firms	%	Cumulative %
1.	7	11.7	11.7
2.	10	16.7	28.3
3.	10	16.7	45.0
4.	6	10.0	55.0
5.	9	15.0	70.0
6.	4	6.7	76.7
7.	1	1.7	78.3
8.	3	5.0	83.3
9.	2	3.3	86.7
10.	8	13.3	100.0
TOTAL	60	100.0	

Source: Interview inputs.

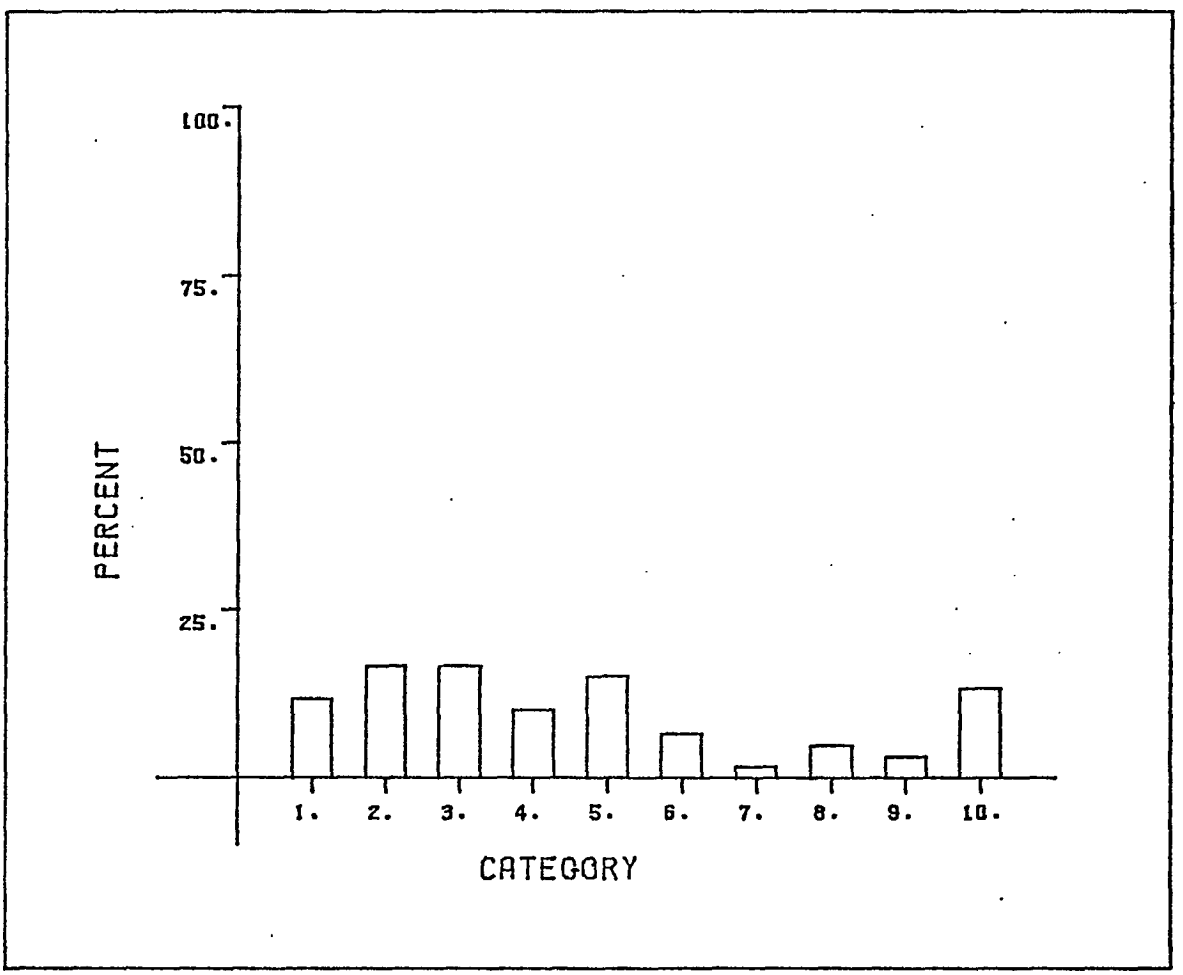


Table 3.2

Assets per firm ($)

	No. of firms	%	Cumulative %
1. Below 49,000	5	8.3	8.3
2. 50,000-99,000	9	15.0	23.3
3. 100,000-199,000	9	15.0	38.3
4. 200,000-499,000	7	11.7	50.0
5. 500,000-999,000	8	13.3	63.3
6. 1,000,000-1,999,999	9	15.0	78.3
7. 2,000,000-4,999,999	4	6.7	85.0
8. 5,000,000-9,999,999	6	10.0	95.0
9. 10,000,000-and more	3	5.0	100.0
TOTAL	60	100.0	

Source: Interview inputs.

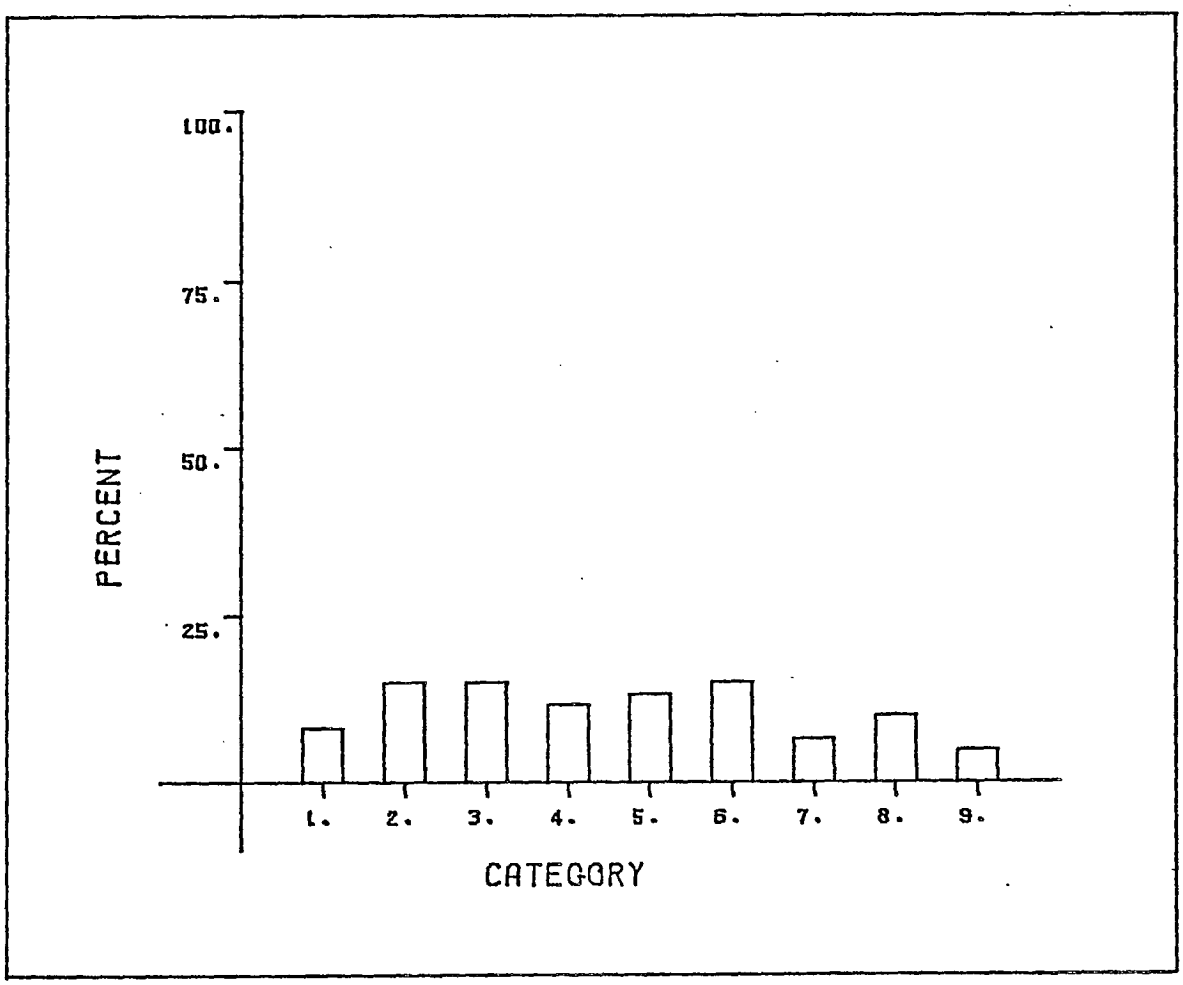
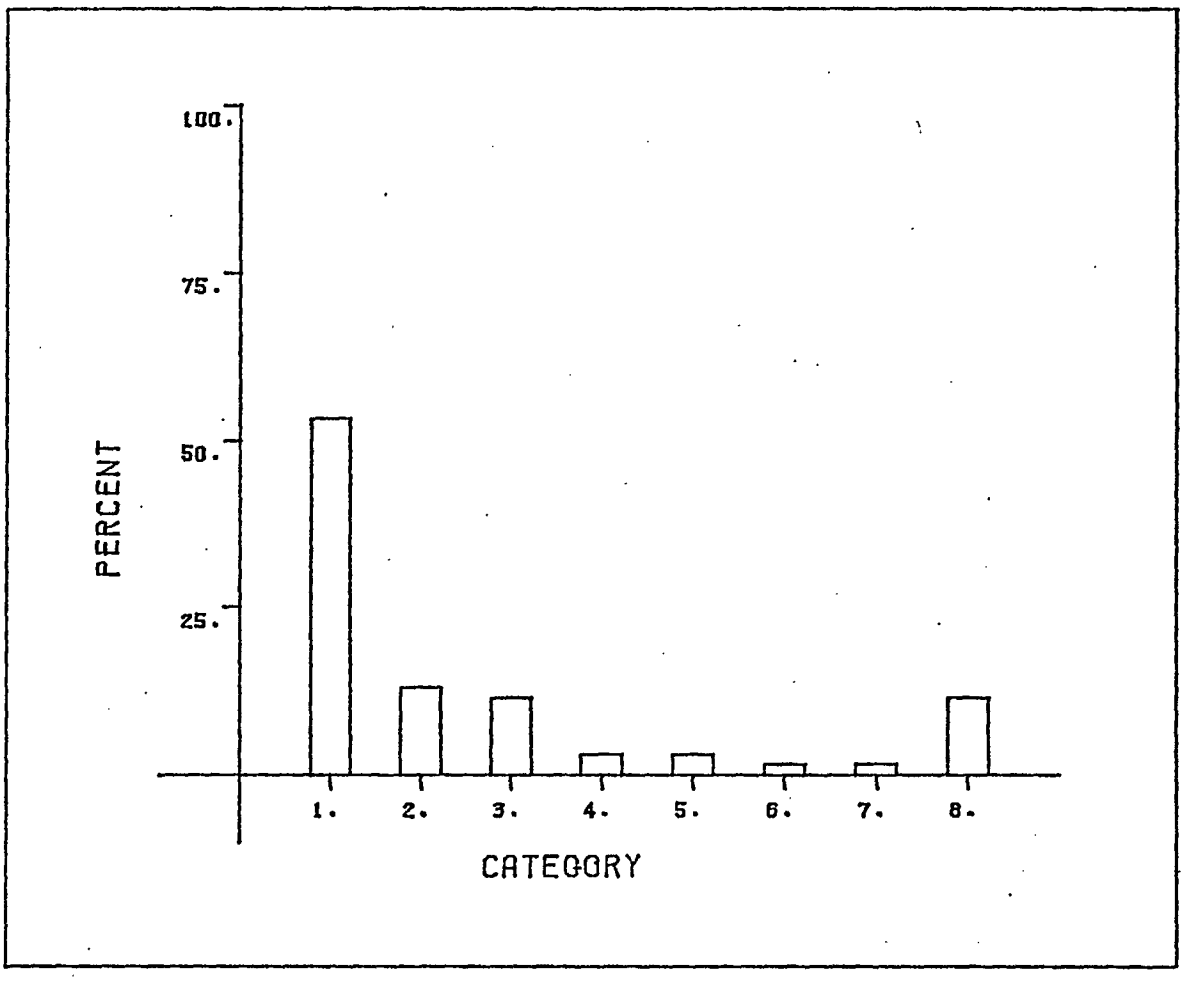


Table 3.3

Area of activity

	No. of firms	%	Cumulative %
1. Oil and gas producers, explorers and developers	32	53.3	53.3
2. Consulting	8	13.3	66.6
3. Well services	7	11.7	78.3
4. Data processors	2	3.3	81.6
5. Equipment sales	2	3.3	84.9
6. Drilling promotion	1	1.7	86.6
7. Manufacturer of oil and gas equipment	1	1.7	88.3
8. Other	7	11.7	100.0
TOTAL	60	100.0	

Source: Interview inputs.



million. As can be gleaned from Figure 3.2, on the whole, the number of firms which had assets larger than $50,000 declines as the value of assets per firm increases.

The main features of small firms

Table 3.3 provides information on the activities of the firms here investigated. Producers, explorers and developers of oil and gas dominated with 53 percent of the total. They were followed by well service businesses and consultants with, respectively, 12 and 13 percentage shares. As our intention was to study the industry as a whole in the setting of the small businesses, rather than one particular activity, our sample contains firms which performed different functions. However, it is not fully representative of the relative numerical importance of the different fields of activity in the industry.

All the firms were incorporated companies; one third of the total, public corporations and the rest, private incorporated businesses.

Table 3.4 presents the results of our enquiry into the principal reason for the incorporation of small businesses. It should be noted that the chief executives interviewed were asked to state the most important single reason for this decision. The results, as recorded in the table, should be interpreted accordingly. This comment applies to all the other tables, of a similar nature, that will be given in this and the other Sections of this Study.

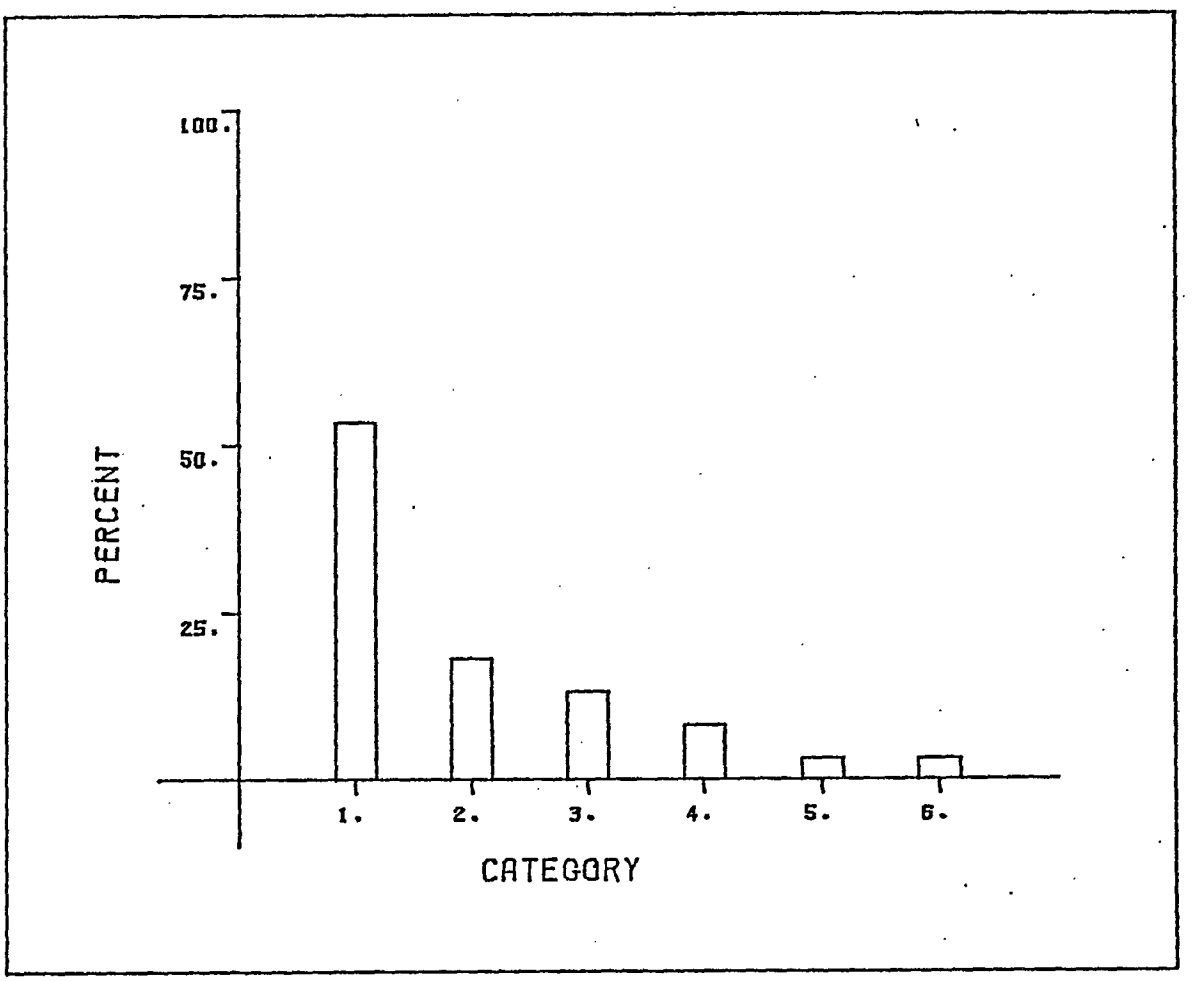
As seen, a majority of the executives incorporated their businesses to benefit from the corporate tax system. In fact, 32 individuals, or 53 percent of the total, stated that this consideration was the main

Table 3.4

The most important reason for incorporation

	No. of firms	%	Cumulative %
1. Tax benefits	32	53.3	53.3
2. Additional funds	11	18.3	71.6
3. Ease of operation	8	13.3	84.9
4. Limited liability	5	8.3	93.2
5. Continued firm life	2	3.3	96.5
6. Subsidiary	2	3.3	100.0
TOTAL	60	100.0	

Source: Interview inputs.



reason. Eleven respondents identified the need for additional funds as the most relevant motivation: Some went public in order to gain access to the stock market while some remained private companies but the incorporation gave them special tax advantages thus enabling them to mobilize additional capital from private sources. For eight units the ease of operations was the principal explanation for incorporation; for others, the limited liability or the desire to continue the life of the firm after the death of its present owner. In two cases, firms were pressured into incorporation by their parent companies for operational reasons.

The form of organization of the new business reflects its current financial and other requirements. Very rarely will a firm in the oil and gas industry be an individual ownership or partnership. Even very small units - one or two joint owners - tend to incorporate. A new business will be for a while a private corporation but, eventually, depending on its performance, and its capital requirements, it will become a public corporation.

Being a private corporation is advantageous to a young business.[1] The shareholders of a private company are often the family members of the founder or his close associates. The shares are held internally by the consortium and the return to each individual on his investment in the business depends on the policy of the firm concerning its internal financing. When interest rates are high and the supply of external finance restricted, the small firm will try to plow back into its operations as much of its net earnings as possible. This can be done in a private company because there is no formal policy concerning the

"dividend" to be paid to the internal shareholders. The primary objective of the venture is to create a viable and profitable business concern in the long run. Occasionally, outsiders may be invited to contribute to the capital of the company and they may be guaranteed a fixed return on their investment or granted convertible debentures. Again, at times, the firm may sell its shares "over the counter".

It transpires that the two principal motivations for incorporation were taxation benefits and a need for additional capital. And if a private company became a public company, the main reason for this would appear to be a need for external development funding via sales of equity shares to the public at large. However, only those companies which recorded a good past performance or offered a promise of such future performance used the technique of public corporation to strengthen their capital base.

Evidently, chief executives of small businesses are at times reluctant to adopt the status of public corporation - some do not wish to expand the size of their business while some make adequate earnings for their current reinvestment needs. The decision to go public may mean that the firm will have to formalize its management structure and enlarge its managerial staff but neither of these changes may be desired by the chief executive or the small nucleus of entrepreneurs. Going public means also standing financial obligations to the external shareholders. If the firm is a private company and it does not generate an adequate return on the capital invested, the matter is internal to the firm and can be resolved within the small circle of private equity shareholders who do not expect a fixed and quick return on their

investments. However, public shareholders expect to get a reasonable return on their equity in the company, which has a commitment in this respect, lest it jeopardizes its future equity share issues. Typically in exploration, a new and small firm may record recurrent losses for a long time - until and when oil and gas are found and put on stream.

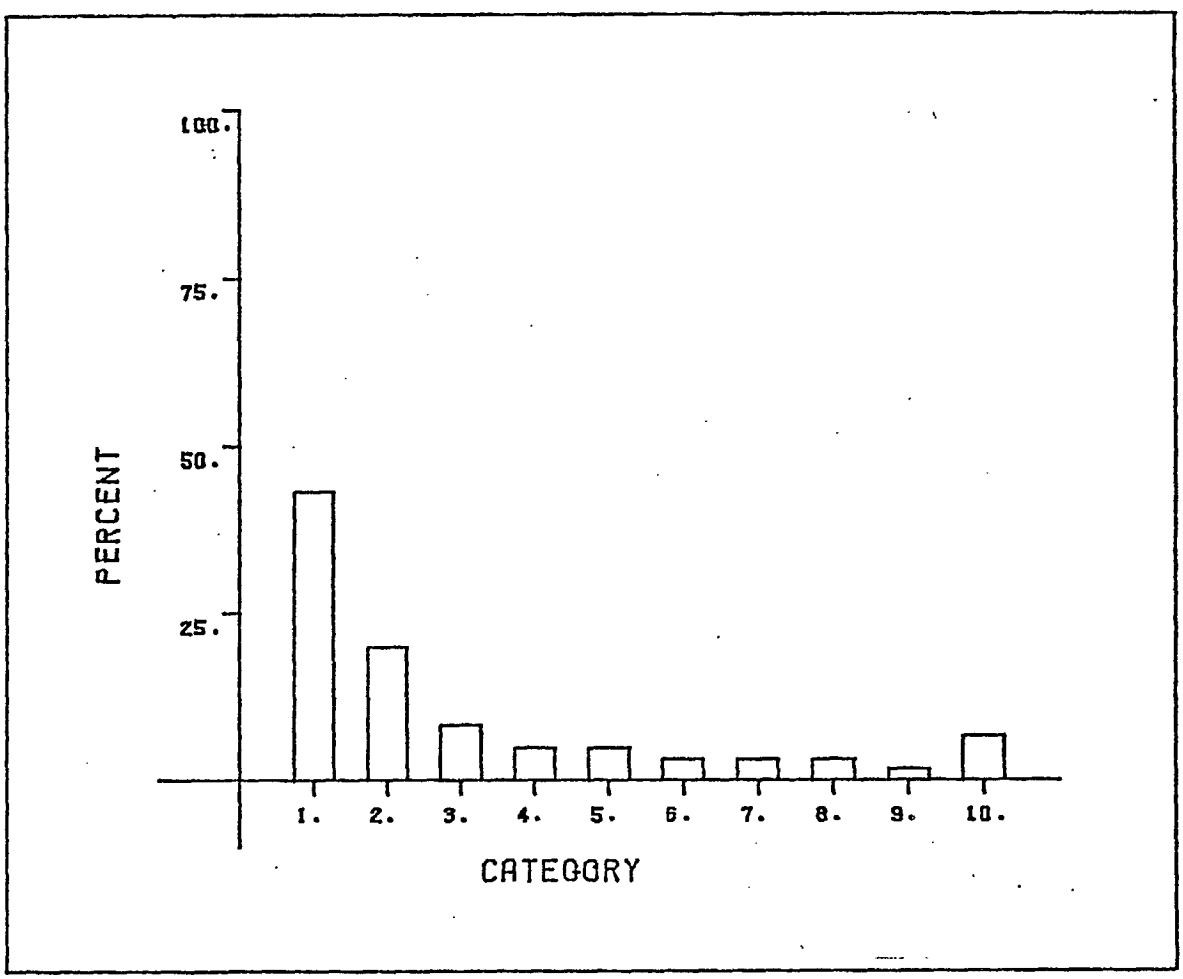
We have seen that the 60 firms in our sample are small in terms of both employment and assets value. We asked the executives what was the most important single explanation for the small size of their firms.[2] The responses are tabulated in Table 3.5. The answers can be split up into two groups. On the one hand, certain factors, largely beyond the control of the chief executive, precluded growth. Four such factors are listed in the Table, viz., joint-consortia of small firms, the subsidiary status of the firm, lack of capital and young age of the firm. Such circumstances constrained the firm's ability to expand, even if its management desired to do so. On the other hand, the management, while free to expand, did not wish to follow this course of action. Five relevant considerations were suggested. As many as 26 executives - 43 percent of the total - asserted that smallness, foremost, means efficient and profitable operations. Twelve reactions stressed the importance of complete control of the firm when it is small. It was contended that only in a small business can its manager personally control all its important operations. As chief executives are independent individuals who desire responsibility, and who are therefore resentful of sharing it with other people, they are reluctant to expand their business because this would entail a loss of

Table 3.5

The most important reason for the existence of small firms

	No. of firms	%	Cumulative %
1. Efficiency and profitability	26	43.3	43.3
2. Complete control	12	20.0	63.3
3. Joint venture consortium	5	8.3	71.6
4. Full use of management	3	5.0	76.6
5. Minimization of "people problem"	3	5.0	81.6
6. Optimal for specialization	2	3.3	84.9
7. Capital shortage	2	3.3	88.2
8. Young firm	2	3.3	91.5
9. Subsidiary	1	1.7	93.2
10. Other	4	6.7	100.0
TOTAL	60	100.0	

Source: Interview inputs.



independent decision-making. In three instances, the principal reason for keeping the business small was the opportunity that this situation provided for the full use of the chief executive's expertise, knowledge and business savvy. In three other cases, the minimization of what the businessmen often called "the people problem" was the primary inducement for staying small. Large size means more people working together and thus an enhanced possibility of personal conflicts. As one respondent put it succinctly: "I am here to run business, not to fight people."

A typical mini-small firm is operated by individuals who know each other well and have worked together, perhaps, for a long time and who, more often than not, are the joint suppliers of the capital of the firm. They complement each other in their expertise, the individual with business experience being the manager - he is the chief executive and he is most likely the founder of the enterprise. The others, typically in exploration and development, are a geologist, a geophysicist, an accountant, and, perhaps, a surveyer. Together, they provide the required human capital inputs into the business. They trust each other and know their respective competencies and failings. There is thus hardly any room for personal conflicts among the members of such a finely attuned business team. Rather, its combined experience and knowledge, and the ability to cooperate, ensure a smooth and efficient business operation. Hence, there is often no desire to bring in additional people unless they are known to the existing partners and are likely to fit in without difficulties. It is interesting to observe

that personal contacts are extremely important in the hiring of executives.[3] Whereas concern with profits, and thus productivity, is paramount, that with the minimization of personal conflicts, which goes along with the above concern, is very important.

As a result of the special human environment, which is unique to very small units, a large measure of flexibility is present. For example, if the firm makes a loss, its associates will get no return on their investments and effort but this does not, necessarily create a crisis situation. Neither does it create a personal financial problem to the individuals involved because they are commonly professionals who earn an income from sources additional to the return on their investment in the firm. And when the firm shows a good profit, the claimants on this return on capital and effort, may be quite willing to see it even entirely reinvested for the sake of the firm's improved future performance. Now, a newcomer may not fit into this order of things. We were told that some small businesses failed because acrimonious discords among the associates tore them asunder.

The last factor that would explain the existence of small firms is that in some lines of production smallness if optimal. (This consideration relates to the first one made above, that is, that smallness ensures efficiency.) This message came to us from the chief executives of the firms which performed highly specialized jobs in the industry that entailed rare skills and expertise. Evidently, such units can be strikingly efficient and profitable.

We met, of course, with cases of rapid expansion over a fairly

short period of time.[4] However, a precondition for this development invariably was a strong desire on the part of the owner to see his firm grow.

Fifty-eight executives, or 87 percent of the total interviewed, stated that they apply advanced technologies in their business. This confirms the generally well-known fact that the industry is highly technology-oriented. The point was frequently stressed by the respondents that the technologies in the industry are constantly, and rapidly, changing. In consequence, some become obsolete over a surprisingly short period of time. The firms are under a constant pressure to keep up with the current technological developments if they are to maintain their relative competitive stance. Small enterprises appear to "run a treadmill" - a lot of effort and money is expended just to maintain the same technological competitive position vis-à-vis the rivals.

Twenty-three chief executives believed themselves to be working in a very highly competitive market and thirty, in a highly competitive environment. Thus, altogether, 53 individuals, or 88 percent of the total, appeared to operate in markets where strong competitive pressures were present. The managers of the remaining seven firms stated they were confronted with weak competition. Two interesting comments were made on the issue of competition. First, the technology embodied in the output of small firms was, evidently, the most important competitive advantage of all. Second, the degree of competition varied with the overall situation in the industry. Over the period 1973-76, when the industry was in the doldrums, competition was fierce but it weakened

considerably over the subsequent boom. It is during the periods of recession that small firms are likely to run into serious difficulties and only the most competitive and aggressive do well. A situation of buoyance in the industry generates strong and new demands for the output of small firms and tends to ease the competitive pressure. In periods of accelerated growth in the industry, "You can sell anything and at any price."

Certain aspects of the competitive scenario, in the setting of the small firm sector, merit special comments. Both large and small firms compete for expertise. The large firms are at an advantage in this respect because they can offer more attractive rewards to managers, specialists and scientists than small firms can.[5] But executives may prefer to work in the small firm sector where they have more responsibility than in large corporations; where business relations are less formal and regimented; their knowledge and experience carry greater weight; and opportunities for self-expression and exercise of talent are greater. However, chances for promotion may be limited and fringe benefits less generous. In contrast, there is more room "at the top of the totem pole" in a large corporation and an individual, who is prepared to conform to its modus operandi, has a greater opportunity for advancement.[6]

Small businesses are exposed to competition for skilled administrative and technical workers. We asked firms if the salaries and wages that they pay to their administrative and production labour are lower or higher than those paid by large businesses for comparable services. The answers were qualified-if there is a shortage of a skill in the industry, the remuneration paid must be comparable. The present boom in exploration has put a premium on many types of skilled field labour and the majors can afford to pay hither rewards.

The small explorer, willing and able to pay more, cannot do so due to the ceiling on the permitted increases enforced under the A.I.B. policy. This is one reason why, occasionally, the administrative staff and skilled labour are paid lower pecuniary rewards in small enterprises.[7] There are several other reason which would explain this situation. The hours of work are overall shorter than they are in large corporations, since shift work and overtime are rarely used. However, part-time workers are used more frequently and more females and younger persons are employed, hence, the quality of labour tends to be somewhat lower. Whereas, on the one hand, the fringe benefits in the small business can be, and frequently are, less generous, the work done for the small business may be more interesting, the responsibilities greater, and the opportunities for learning a new job more readily available. The excellent labour-management relations also are important in this respect.[8] When problems arise they are discussed with the management and solutions are found. This does not mean that labour is invariably satisfied because small businesses would appear to experience a higher labour turnover.[9]

Recently there has been an acute shortage of drilling rigs. Their price, as a result, has risen dramatically and the small firm, again, is at a disadvantage in this respect. The reason for this shortage is that over the period 1973 to 1976 - a period of disincentives to exploration in Canada - there occurred an exodus of rigs to the United States. Furthermore, few new rigs were built in Canada at the time. The sudden reversal in the official policy, which gave new and sizeable incentives to drilling, caught the industry unaware and some

small firms find it difficult to obtain rigs which are at sky-high prices.

Small and large firms compete for oil and gas land. While the shortening of the leases to five years has led to more land becoming periodically available to the industry, the value of oil and gas lands has rapidly increased and small producers are outbid by large companies for the best quality land. As a result, the small firm tends to take what it can afford and what is available to it.

Additional competition arises for the sales of gas. We were told that many small firms who achieved their objective of finding gas are not in position of selling it at present. It would appear that some 3,000 producing wells are shut-in in Alberta awaiting an opening in the market. And it seems that the present system of prorationing of both land and gas sales tends somewhat to favour the large producer. The adverse effect of this situation on the incentives to explore for gas are obvious.

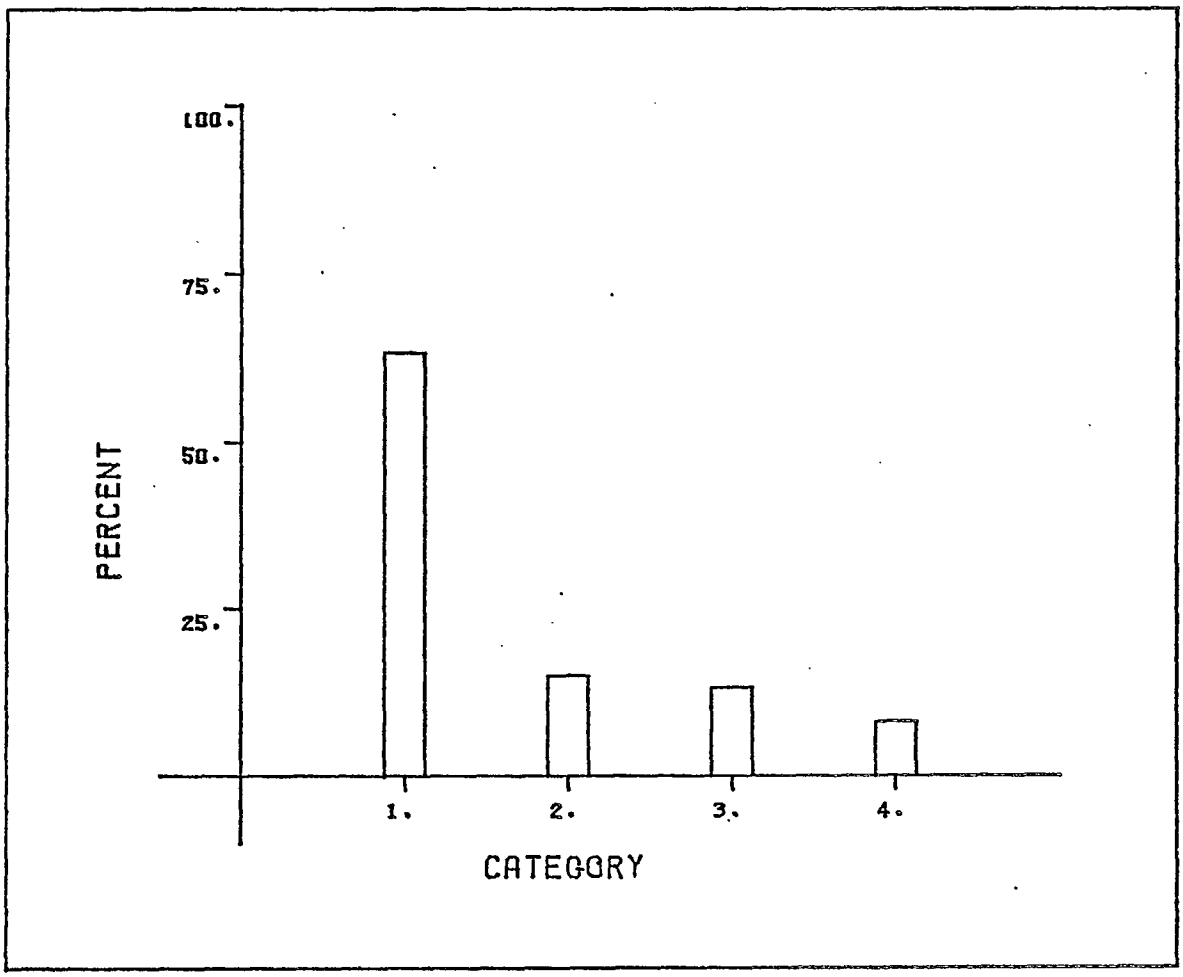
As Table 3.6 shows, small firms vary notably in the nature of the markets in which they sell their outputs. Most sell to many small and large firms - there were 38 such units or 63 percent of the total. Some of these units were, to use an earlier terminology, "market competitors" because they competed with large firms in the same markets. We note that 8 firms were selling their output exclusively to large firms, hence, they appear to be "satellites". Next, a group of 9 firms had their principal markets among other small firms. Some of these enterprises were consultants. Finally, 5 small businesses were dealing with few small and large companies. Again, they were specialists but

Table 3.6

Number and size of customers

	No. of firms	%	Cumulative %
1. Many small and large companies	38	63.3	63.3
2. Mostly small companies	9	15.0	78.3
3. Large companies	8	13.3	91.6
4. Few small and few large companies	5	8.3	100.0
TOTAL	60	100.0	

Source: Interview inputs.



had no exclusive attachment to large firms.

The next characteristic of the firms investigated is their age and the relevant information is shown in Table 3.7.

The age of firms in the sample varied from one year to ten years and more (three units). The most common age was five years, the least common age was two years, and the average age was just over six years. As is seen readily from Figure 3.7, the number of firms increases with their age over the age-range of two to five years. But this relationship does not hold for older firms. If we take arbitrarily five years of age as the benchmark between the "old" and the "young" firms, we note that almost one-half of the total were in the second category. The small firm sector, evidently, has had a lot of new blood recently.

The final characteristic of the firms in our sample, to be discussed presently, is their profitability. Given the nature of this variable the evidence we obtained from our interviews must be interpreted with due care - we are relying here on the expressed opinions of business executives. As many firms in the sample were private companies which do not publish their financial statements, we relied entirely on what we were told. We simply asked the question whether the profit performance of the firm has been satisfactory or not. In 52 responses - nearly 87 percent of the total - the reaction was affirmative. In a later section of this study (Section 7) we will be in position to throw more light on this important issue.

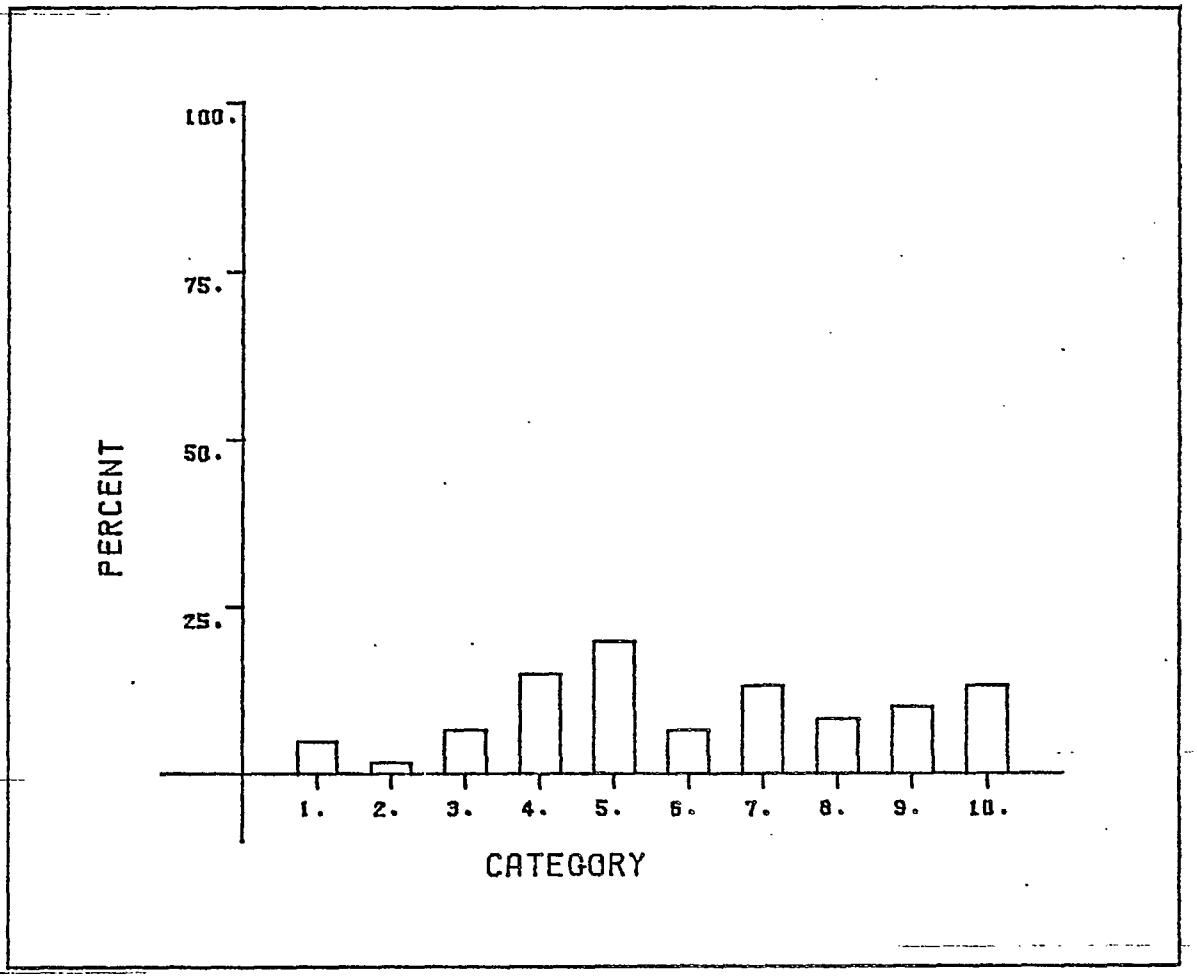
Our enquiry concerning the profitability of small firms during the interviews extended to two topics, namely, we asked our respondents about the most important reason for, on the one hand, the success of

Table 3.7

Age of firm

Years	No. of firms	%	Cumulative %
1.	3	5.0	5.0
2.	1	1.7	6.7
3.	4	6.7	13.3
4.	9	15.0	28.3
5.	12	20.0	48.3
6.	4	6.7	55.0
7.	8	13.3	68.3
8.	5	8.3	76.7
9.	6	10.0	86.7
10 and more	8	13.3	100.0
TOTAL	60	100.0	

Source: Interview inputs.



small firms and, on the other, their failure or poor performance. Although the answers to the second issue can be anticipated from those we obtained to the first issue, nonetheless, there is something to be gained when the two sets of answers are examined separately.

We read from Table 3.8 that no fewer than 30 executives, or exactly 50 percent of the total, contended that able management was the most important factor in success. Adequate supply of finance and favourable markets were the two runners-up. The last factor above reflects the present restrictions on the sales of gas. Of the remaining influence, "good luck" is of interest. This factor is present in exploration and it may be a decisive element in the fortunes of small enterprises. These small firms, if they do not find oil and gas, simply go out of business. It goes without saying that if they discover oil and gas, but cannot put this output on stream, because they have no markets for it, their position is not much improved. It may be nice to know that the inventories of oil and gas a firm commands may appreciate in the future with rising prices but the fact remains that the enterprise has no current cash-flows which are essential for its operations. It is notable that 8 firms only expressed the view that adequate finance was the most important prerequisite for success. This is in line with a frequent comment that, to run a small business, "You do not need capital but you must know how to make money." Finally, innovativeness did not score a high mark. The same goes for knowledge of the industry, experience and contacts.

According to the statistics of Table 3.9, and predictably so, the primary explanation for the termination of independent operations, or

Table 3.8

The most important reason for success

	No. of firms	%	Cumulative %
1. Able management	30	50.0	50.0
2. Adequate finance	8	13.3	63.3
3. Favourable market	8	13.3	76.6
4. Good luck	6	10.0	86.6
5. Experience and contacts	2	3.3	89.9
6. Innovativeness	2	3.3	93.2
7. Knowledge of industry	1	1.7	94.9
8. Other	5	5.0	100.0
TOTAL	60	100.0	

Source: Interview inputs.

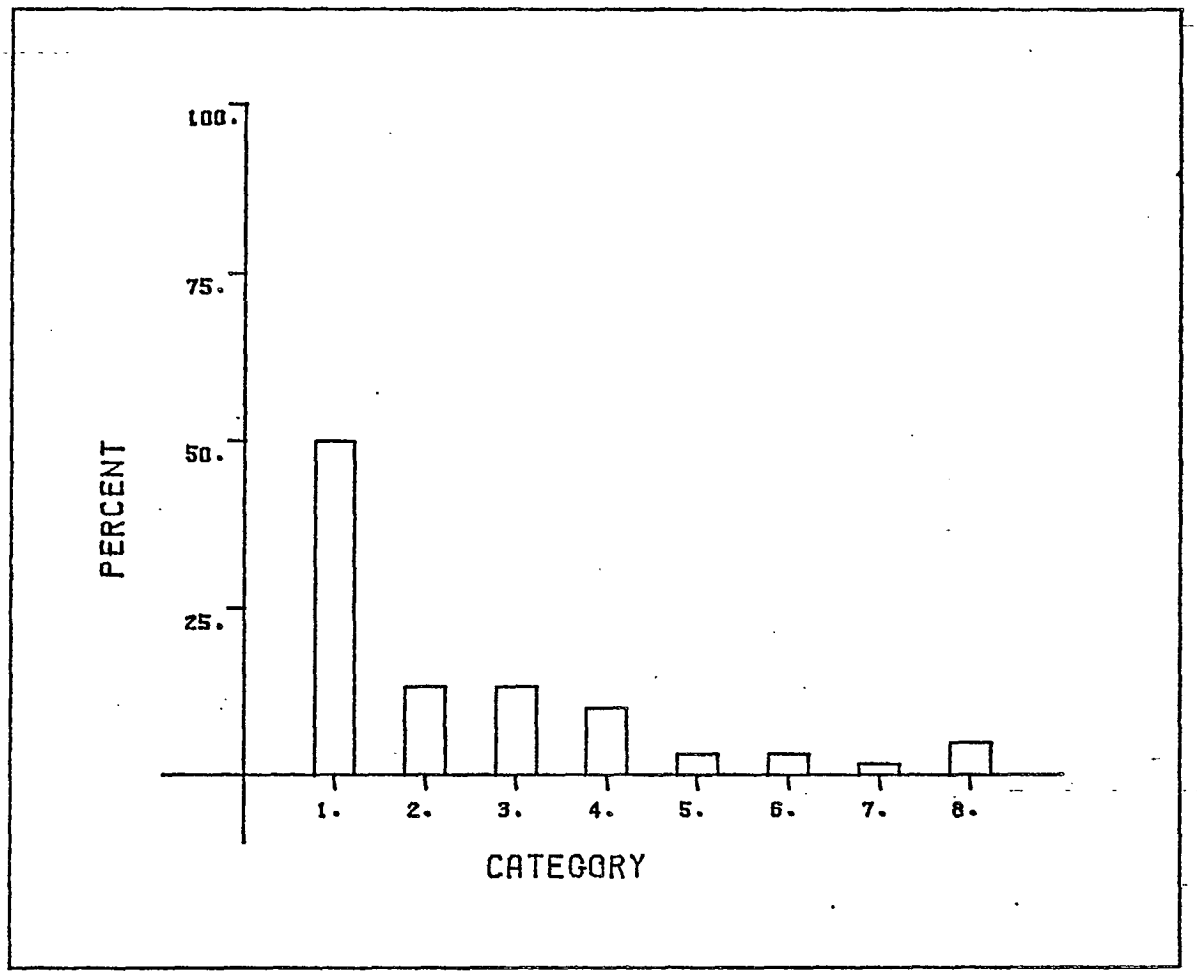
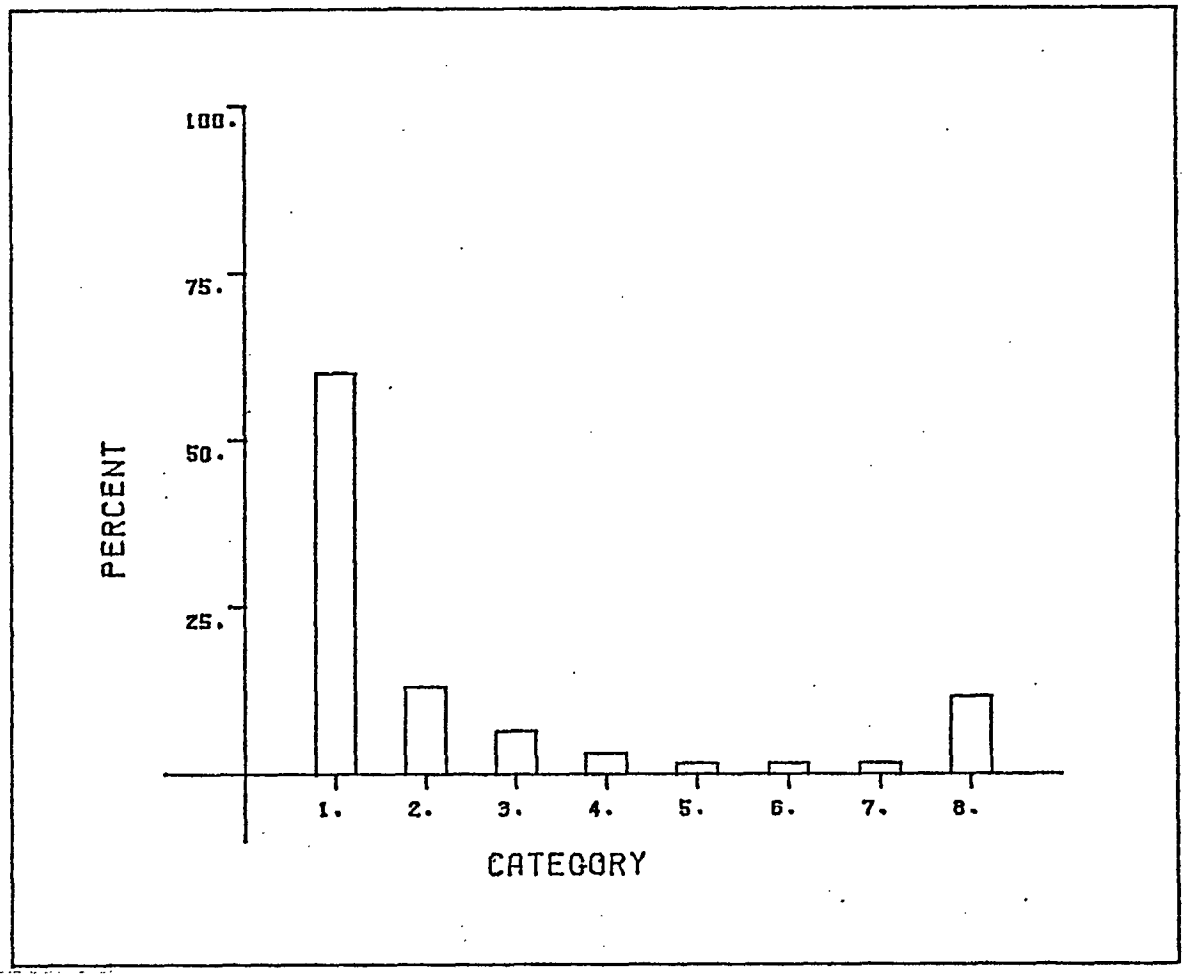


Table 3.9

The most important reason for cessation of (independent) operations

	No. of firms	%	Cumulative %
1. Poor management	36	60.0	60.0
2. Overextension	8	13.3	73.3
3. Financial problems	4	6.7	80 0
4. Owner leaves	2	3.3	83.3
5. Take-over or merger	1	1.7	85.0
6. Profitable firm sold	1	1.7	86.7
7. Other	1	1.7	88.4
8. No comment or do not know	7	11.7	100.0
TOTAL	60	100.0	

Source: Interview inputs.



bankruptcy, of small firms was poor management. This failing would also explain why some executives believed that overextension and financial problems were the two other important causes. A few firms, known to our respondents, which had been doing poorly, or had been nearing bankruptcy, were taken over by, or merged with, other firms. It goes without saying that the firms that are taken over, merged or sold may also be viable businesses. Termination or liquidation could also occur when the owner changed his business activity. Finally, one factor under the "other influences" was the advanced age of the owner who decided to sell his business.

The characteristics of the chief executive of the small firm

We will now identify and discuss some characteristics of the chief executives of the sixty firms that were interviewed by us. Additional specific attributes of these individuals will be analyzed later when we will turn to the different roles they play in their businesses. For example, when in Section 4 we will deal with the entrepreneurial function, their characteristics and endowments in this respect will be examined.

The small firms in our sample were managed by males.[10] Only one firm was run by a female but she acted on behalf of the absent male chief executive. In two instances, the business was operated jointly by husband and wife; however, the primary responsibility of the male was management while that of the female was administrative work. We learned that in many small units female associates and female administrative personnel participate, to a varying extent, in important decision-

making processes. Basically, however, the small firm management is an exclusive male domain.

The chief executives in our sample were mostly Canadians. Thus 53 persons, or 88 percent of the total, were Canadians (some by naturalization) and 7 were foreigners. Five foreign executives were U.S. citizens and two were British. This sharply contrasts with the nationality of the chief executives of large corporations in the oil and gas industry who are overwhelmingly of foreign, particularly U.S., origin.

Table 3.10 presents our findings on the age distribution of the chief executives. The age ranged from 27 to 77 years, the mean age being 43 years and the modal age 50 years. As can be seen from Figure 3.10, the modal age is well defined as it comprised 20 executives, or one-third of the total. If we define the age of up to 45 years as being "young", we see that 48 percent of the executives were in this category. If we lower this critical age to 35 years, we observe that 17 percent of the total number of managers were actually "very young". We came across a few cases of youthful individuals who achieved a remarkable success in business. One, in his early thirties, was the chief executive of two firms, both sound and expanding concerns. At the other end of the age spectrum there were only 3.3 percent of the individuals - "old" or "very old", if the critical age level is set at the age of 61 or more. Figure 3.10 shows that as the age of the executives rises so does their number but beyond the age of 50 years this relationship is reversed. Interestingly, only 18 percent of the managers of small firms were older than 50 years.

The formal education of the chief executives, on the whole, was

Table 3.10

Age of chief executive

Years	No. of firms	%	Cumulative %
1. 26-30	2	3.3	3.3
2. 31-35	8	13.3	16.7
3. 36-40	7	11.7	28.3
4. 41-45	12	20.0	48.3
5. 46-50	20	33.3	81.7
6. 51-55	5	8.3	90.0
7. 56-60	4	6.7	96.7
8. 61-plus	2	3.3	100.0
TOTAL	60	100.0	

Source: Interview inputs.

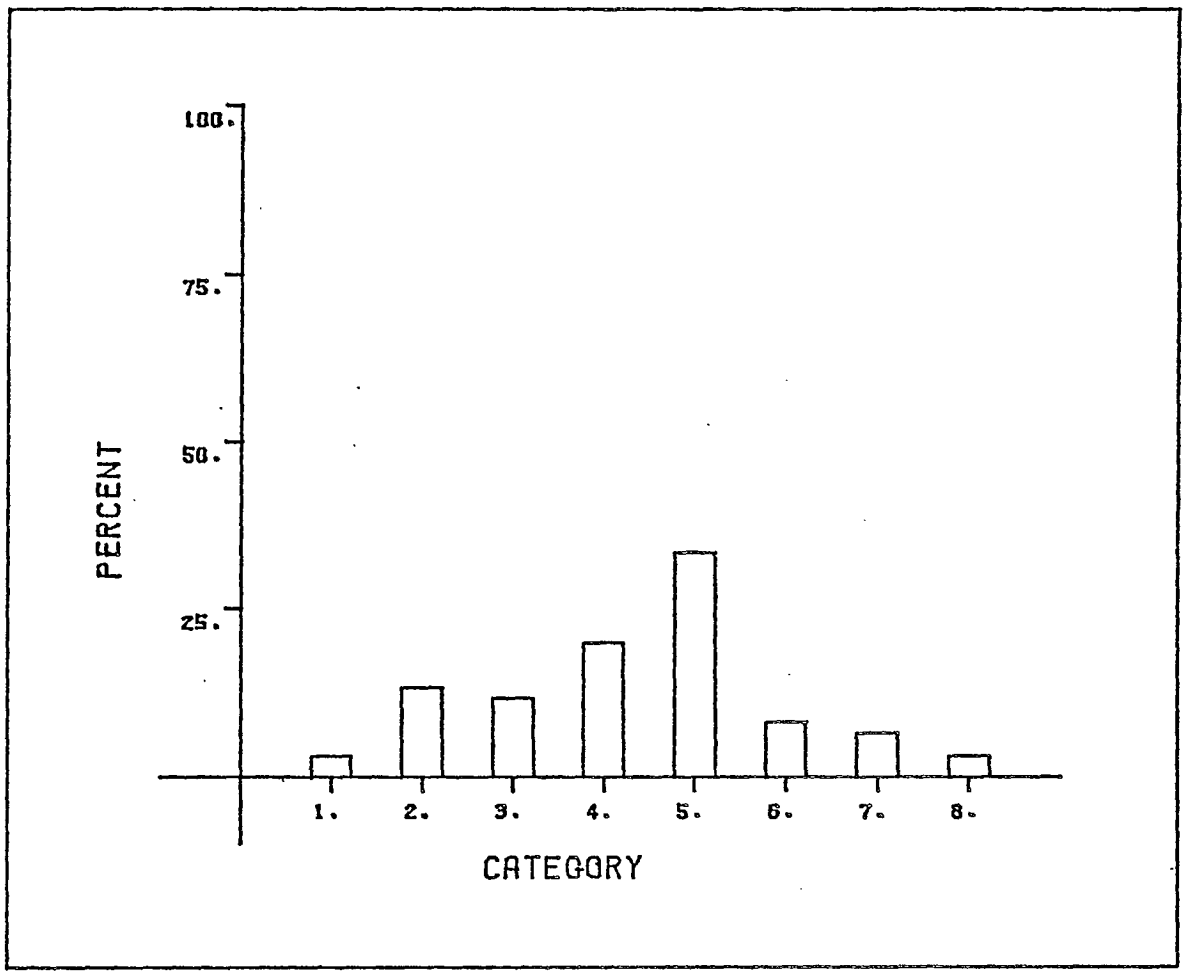


Table 3.11

Formal education of chief executive

	No. of firms	%	Cumulative %
1. Some primary	1	1.7	1.7
2. Primary	1	1.7	3.3
3. Secondary	4	6.7	10.0
4. First university degree	50	83.3	93.3
5. M.A. degree	2	3.3	96.7
6. Ph.D.	1	1.7	98.3
7. Other	1	1.7	100.0
TOTAL	60	100.0	

Source: Interview inputs.

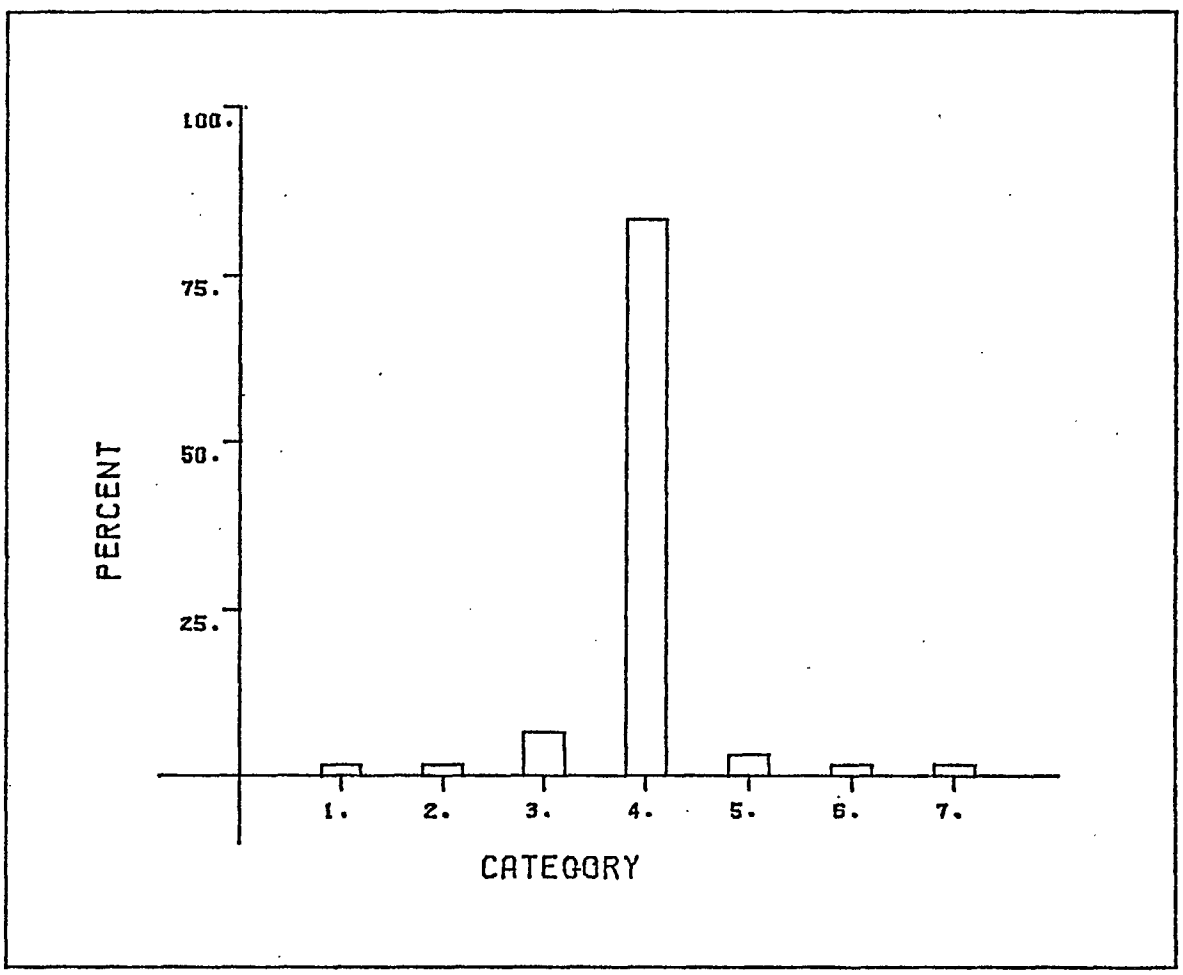


Table 3.12

Area of education of chief executive

	No. of executives	%	Cumulative %
1. Geology and geophysics	29	48.3	48.3
2. Engineering	17	28.3	76.6
3. Economics and commerce	5	8.3	84.9
4. History and geology	5	8.3	93.2
5. History and law	2	3.3	96.5
6. Fine arts	1	1.7	100.0
TOTAL	60	100.0	

Source: Interview inputs.

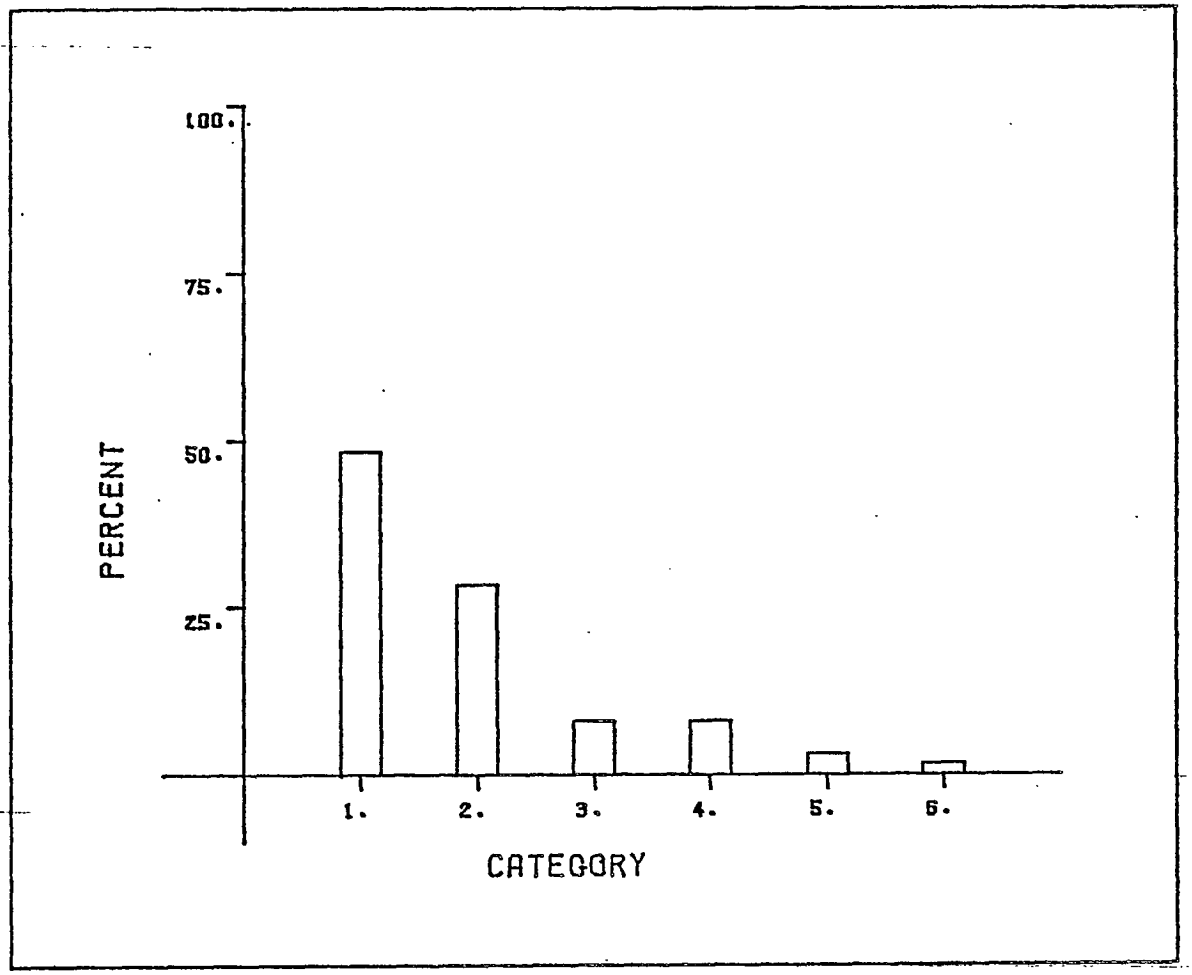
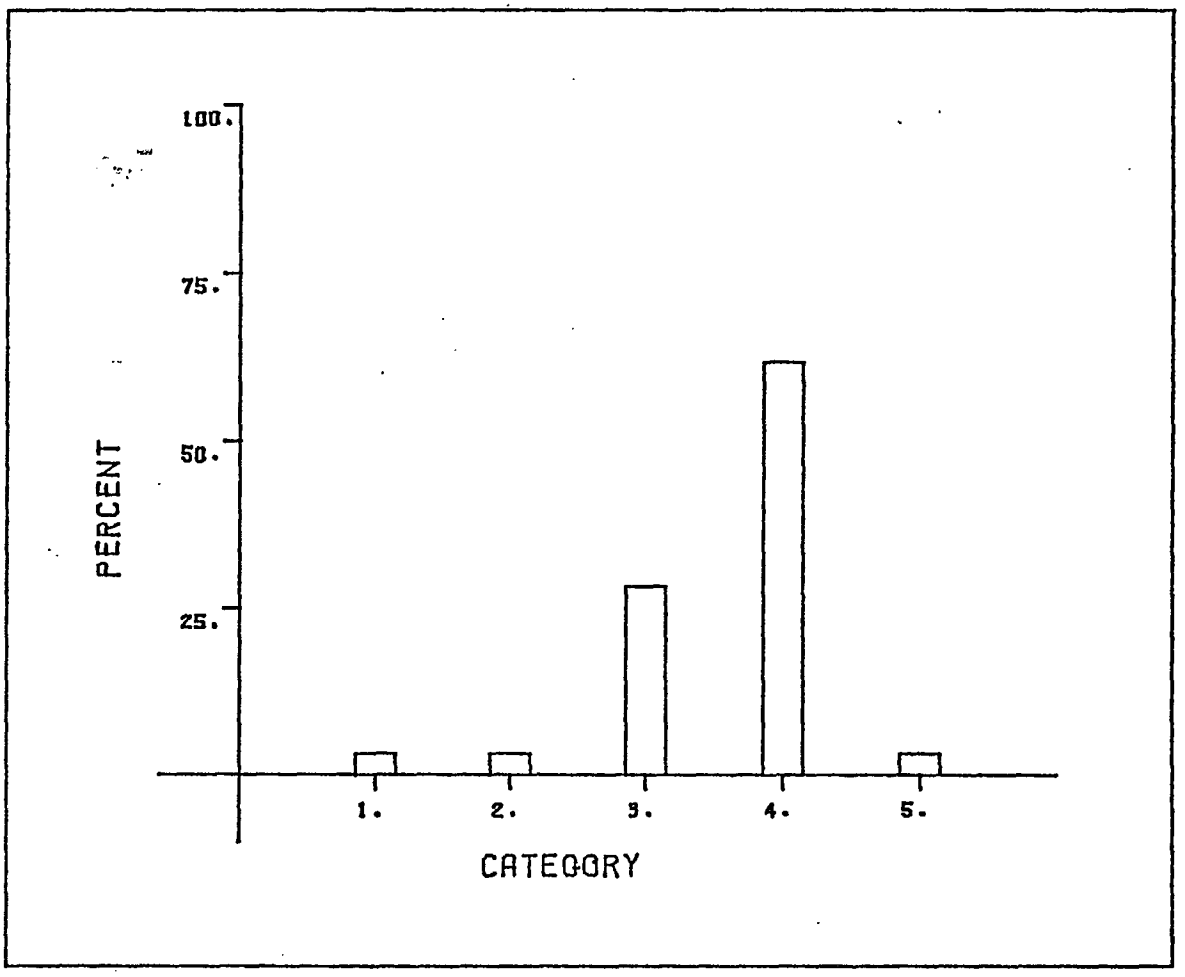


Table 3.13

Experience of chief executive

Years	No. of executives	%	Cumulative %
1. No previous experience with majors	2	3.3	3.3
2. Up to 2 years with majors	2	3.3	6.7
3. Up to 10 years with majors	17	28.3	35.0
4. More than 10 years with majors	37	61.7	96.7
5. More than 10 years with majors and government	2	3.3	100.0
TOTAL	60	100.0	

Source: Interview inputs.



high, as will be seen from Table 3.11. Fifty-three individuals had, at least, a first university degree and they accounted for as much as 88 percent of the total. Two executives had M.A. degrees and one had a doctorate in geology. It will be noted that six executives had no tertiary education, one had primary education and one some primary education. The person who had some primary education was the chief executive of one of the most successful small businesses we came across in our interviews.

The next set of statistical information - Table 3.12 - deals with the discipline of the formal education of the executives. Geology and geophysics prevail, followed by engineering. Five persons had formal education in economics and commerce and three in disciplines (fine arts, history and law) which apparently bear no relation to business. Conspicuously, not a single executive in our sample had formal education in business management.

We were also interested in the business experience of the chief executives. In this respect Table 3.13 is revealing because it documents the fact that the majors in the industry are the main training ground for the future chief executives of the minors. It turns out that 37 individuals, or 62 percent of the total, had more than 10 years experience with the majors prior to setting up their own businesses. Nineteen individuals had such experience up to 10 years duration. And two had more than 10 years experience with both the majors and the government. Remarkably, only two individuals had no experience with majors prior to starting on their own. To put it differently, 58 chief executives of small firms, or 97 percent of the total, had an employment with a major prior to launching their own enterprises.

Notes to Section 3

1. But being a minority shareholder in a private company may not be advantageous: "You do whatever the boss does because he has a majority share. And you cannot get out as you can get out in a public company - you just give an order to your broker - but not so in a private company."

   Widespread incorporation, solely for the sake of the benefits of special tax treatment of small enterprises in Canada, has caused concern. The November, 1978 Budget redefined the concept of the small business to check this practice. The government discovered that a much narrower and more careful definition is needed to prevent individuals from simply incorporating themselves as small businesses to take advantage of special tax benefits available to these organizations. Groups of lawyers, chartered accountants, doctors, dentists and other professionals band together into so-called small businesses to qualify for tax rates more lenient than those to individuals.

2. For a discussion of the factors which limit the size of firms, see, Hollander et al., op. cit., pp. 14-16.

3. See, "Small firms gain edge in head-hunting raids," Financial Post, December 20-27, 1975.

4. Important studies on the growth of small firms are: B. Bernholtz and J.P. Rives, "The Stage Model of Growth and Small Firms—An Alternative Hypothesis," Working Paper No. 77-002, Department of Industrial Engineering, University of Toronto, Feb. 1977; M.J.K. Stanworth and J. Curran, "Growth and the Small Firm—An Alternative View," Journal of Management Studies, Vol. 13, 1976, and R.B. Buchele, Business Policy in Growing Firms, Chandler Publishing Co., Scranton, Penn., 1967.

5. The Bolton Report found that wages and salaries per person employed rise with firm size (op. cit., Ch. 3.6 and Table 4.II). Royal Commission on Corporate Concentration concluded that in general large businesses pay bigger total compensation than smaller enterprises do (Final Report, pp. 355-371).

6. See, "Fighting your way up that office totem pole," Montreal Star, April 5, 1977.

7. Small firms can remedy the situation, to some extent, by providing generous food and clothing to field workers in addition to the monetary pay (a skilled worker on the rigs can make more than $250 per day). Again, the system of bonuses is used to retain skilled labour (in such activities as, for example, shooting seismic and cutting). We were told that, "in a busy month they can pick up a double wage."

8. Royal Commission on Corporate Concentration (op. cit.) studied at length the relationship between size of firms and labour relations. See, in particular, Final Report, Ch. 15 (Business size and working

conditions), Study No. 27 (Organization size and alienation) and Study No. 33 (Organization size as a factor influencing labour relations).

9. One businessman commented on this situation as follows: "We have a very high turn-over because there is a shortage of skilled labour. I get them through contacts - someone may be unhappy in present employment and he is a prospect for us. The AIB policy has been a disaster in Calgary - you cannot reward people and they jump from job to job."

10. See, "Board rooms still remain male bastion," Toronto Star, August 30, 1977 and "Patricia Adams'launching Association of Women Executives challenges 'old boys'," Toronto Globe and Mail, February 16, 1977.

SECTION 4

THE UBIQUITOUS CHIEF EXECUTIVE OF THE SMALL FIRM

The individual who manages the small firm performs many functions which will be examined in this Section. He may be the founder of the firm; the sole, or principal, supplier of its equity capital, hence, its owner and financier; the investor of the capital, thus, a risk-taker; the sole decision-maker or manager; an inventor and innovator; and, finally, the administrator and worker. In a minute enterprise the chief executive is a unique functional multi-hybrid. From this embryo stem all the other species of business right up to the mature giant corporation. As the size of enterprise grows, the business functions are increasingly carried out by different individuals and at the level of a large technostructure, by teams of specialists. In between the two extremes - the tiniest enterprise and the dominant corporation - there is a wide gamut of organizational mutations.

The multifarious functions of the chief executive cannot be finely delineated and separated from each other. However, for the sake of simplicity of exposition, we will view this individual in his role as, first, the entrepreneur, second, the financier and risk-taker and, third, the inventor and innovator.

The chief executive in his role as the Entrepreneur

When interviewing business executives of small firms, we soon realized we were dealing with a very special and unique breed of individuals. They are driven by a strong need for achievement; seek challenge

and responsibility; take risk in which their personal effort can achieve a successful outcome; have emotional stamina, that is, they are energetic and are hustlers in a positive sense and maintain self-control when pressures are brought to the boiling point; pursue objectives with tenacity and persistence; and are generally inquisitive, mentally resourceful and intelligent, physically healthy, and capable of hard and sustained work. *

Some theories of entrepreneurship assert that, prior to the setting up of their own business, the future entrepreneurs are exposed to a "personal displacement."[1] We asked questions about this issue and we infer from the reactions received that some respondents were exposed to a kind of personal displacement when they were employed with large corporations (it will be recalled from the previous Section that a large majority of the executives of small firms had worked with the industry's majors before becoming independent businessmen). This displacement, which invariably generates a feeling of resentment, frustration and dissatisfaction, may occur in different circumstances; it may be that the individual strongly disapproved of some important decisions of his superiors which, eventually, turned out to be wrong; was by-passed in promotion and thus saw no prospect for advancement; his solicited advice to his superiors was abruptly rejected but was correct; was unjustly treated by the employer in some fashion; and was fired.[2] Apparently, the entrepreneurial type does not have the attributes of a good employee because he rejects routine and authority and is imbued with a desire for independence. Furthermore, he is self-motivated and tends to set his own standards and goals; in consequence, he tends to go his own way.

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* See Appendix 6.

In a nutshell, the entrepreneurial employee does not go along with the disciplines of the corporate regime and this idiosyncrasy breeds personal conflicts. Some analysts contend that this type of individual, when young, is difficult to handle by his parents and teachers. The youthful entrepreneur often is a belligerent and aggressive child and a poor achiever at school.[3]

Other factors in personal displacement, that appear to have catapulted a few entrepreneurial individuals on the path of the independent business, are personal tragedies - domestic problems, a prolonged and serious illness and similar events.

Whatever may be the nature of the syndrome of personal displacement, its operation is clear: it acts as a catalyst to the dormant and suppressed creativity of the individual and launches him on a new career.[4] Evidently, once the idea of being one's own boss catches imagination there is no retreat because it becomes an exciting and overpowering prospect.

Since our society is technologically progressive, dynamic, highly organized, complex and competitive, to succeed in his venture of setting up and operating a viable business operation, the individual must be endowed with very rare qualities and attitudes.[5]

The entrepreneur displays a conspicuous proclivity for total commitment to his business to the exclusion of almost everything else. The businessmen whom we interviewed expressed the view that running a small business is not just a form of employment, but is a totally absorbing modus vivendi. He is endowed with courage, that is, he is capable of accepting a challenge and, more importantly, the possibility

of failure. He is thus able to take various reversals and disappointments in the right vein, that is, he views these occurrences as inevitable parameters of his career. This resistance to breaking down under stress carries him over all the adverse vicissitudes of a new and untried course of action. Although he does not seek a crisis situation, when it occurs he learns from it thus acquiring additional experience. The entrepreneur is always prepared to take risk and is ready to plunge into situations in which he feels a discomfort. He feels distinct uncomfortableness because his behaviour is unorthodox as he follows unexplored paths. A considerable staying power permits him to survive the testing and critical infant years of his venture. An ability to communicate on a person-to-person basis permits him to cultivate extensive personal contacts. An ease of expression in the written and spoken word is an important asset of his human capital. He is a good listener and learner and quickly perceives any opportunity for his business that arises from the contacts with others. The entrepreneurial individual has strong integrity, is honest and his manner is gentlemanly (indeed, only true gentlemen could endure the persistent questioning to which the executives were exposed during our interviews). His intelligence enables him to analyze complex situations and to make right decisions. Most people only know what they are taught and what they have been told but a successful entrepreneur assembles experience and information, processes it mentally, and comes up with constructive conclusions. In consequence, he often sees a situation in a totally different light than the others do and turns it to his advantage.

A dramatic example of this exceptionally rare entrepreneurial quality is the story of Canadian Hunter Exploration Ltd. as told by its executive vice-president, Mr. Jim Gray.[6] It exemplifies how a unique opportunity was identified and very successfully exploited by Canadian talent and capital. This opportunity was perceived in 1973 by the two founders of the company, Jim Gray and John A. Masters[7] (the "two guys with a telephone," to use Mr. Gray's apt paraphrase). At the time, the industry was in the midst of violent posturings between the Alberta and Federal governments with respect to the division of spoils from the increased oil and gas prices. The low wellhead prices triggered off a mass exodus of capital to the United States where the rewards were better and less uncertain. Businesses were either leaving the West or reducing their activities. ("The bumper sticker at the time was: 'The last man out will turn out the light'.") It was at that time that the Canadian Hunter Company was being set up by the Gray-Masters entrepreneurial duo. Their perception of the situation was diagrammatically opposed to that of the industry as a whole, namely, they believed that the time was ripe not for leaving the industry but for getting into it. Two factors were taken into consideration by the two entrepreneurs. On the one hand, prices of oil and gas land were unusually low and, on the other, a significant percentage of the increase in prices of oil and gas in that year was bound to track its way back to the wellhead. At higher price, and due to constantly improving exploration technologies, the vast unexplored petroleum resources in Alberta would thus become economical.

In their search for seeding and development capital the two

promoters approached over 20 Canadian companies but were unsuccessful until they contacted the Noranda Mines Company, which has interests in mining. The Noranda management saw the prospect of developing the unexplored oil and gas resources - just like deposits of low grade mineral ores which needed a rise in the mine-head price to be explored profitably - and it provided the initial capital for Canadian Hunter. Since 1973 the company has spent, not just the originally projected $25 million, but actually $150 million; it has acquired two million net acres in Western Canada; it employs 70 persons; and its estimated cash-flow in 1978 will be around $8 million. The total value of the company is some billion dollars. The company discovered the Elmworth play in which it has a preemptive position. This field may be the most important in Canada and, probably, the largest in the whole of North America.

It is very infrequent, however, for individuals to possess all the entrepreneurial attributes that were mentioned earlier. No doubt, the entrepreneur is a rare type, always in short supply in any economy. Apparently, the supply of entrepreneurial talent cannot be easily enlarged because entrepreneurs are born, not made. It is of interest to reiterate that none of the 60 chief executives interviewed by us had formal training in business management. It would thus appear that the art of operating a small business must be almost entirely learned on the job, particularly so in the oil and gas industry, which is a very complex and difficult field of business management. Whereas formal education and business experience are useful prerequisites, they are not sufficient conditions for success in small enterprises. It is the

special qualities of the entrepreneur which make for the success when an individual strikes out on his own by initiating business enterprise at his own risk. In the light of the above considerations, the statement made by the Honorable Judd Buchanan, Minister of State for Science and Technology, in August, 1978, that business schools in Canada are an utter failure because they have not produced enough entrepreneurs is surprising because business schools are not laboratories where full-fledged entrepreneurs are cloned.

We enquired into the main reasons for starting an independent business. Fifty-six respondents - 93 percent of the total - informed us they simply had a desire to be on their own and believed they had sufficient expertise in business to take this step. The remaining three executives stressed achievement as the primary motive.

According to our findings, 48 executives, or 80 percent of the total, were founders of the enterprise they managed. This finding can be explained in a number of ways. First, as noted earlier, the average age of the firm in our sample was 6 years. Although the incubation period of the enterprises was well over, the firms were still in their infancy. Second, operating a small business is a life style and one does not change one's life style often. Third, there is lot to be gained if the entrepreneur continues with the business that he initiated because there are no two identical firms in the industry - enterprises are like people. Hence, in a meaningful sense, the chief executive is a specialist, and it is advantageous for the founder to stay with the firm and further enrich the expertise he has already accumulated in operating it. In this way he captures the economies of continuity. However, there

Table 4.1

Decision making

	No. of responses	%	Cumulative %
1. Entirely independent	47	78.3	78.3
2. Partially independent	9	15.0	93.3
3. Mainly independent	3	5.0	98.3
4. Mainly controlled	1	1.7	100.0
TOTAL	60	100.0	

Source: Interview inputs.

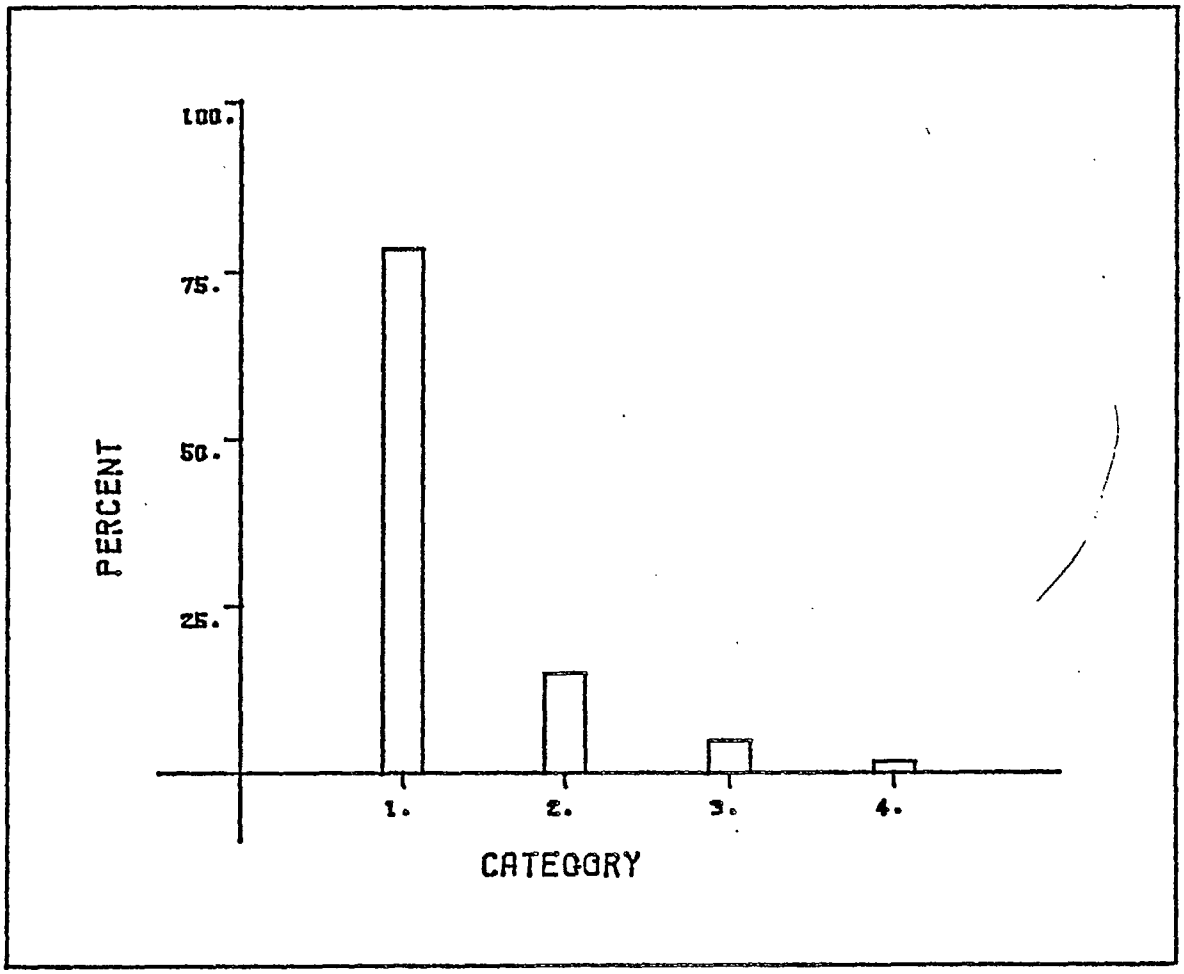
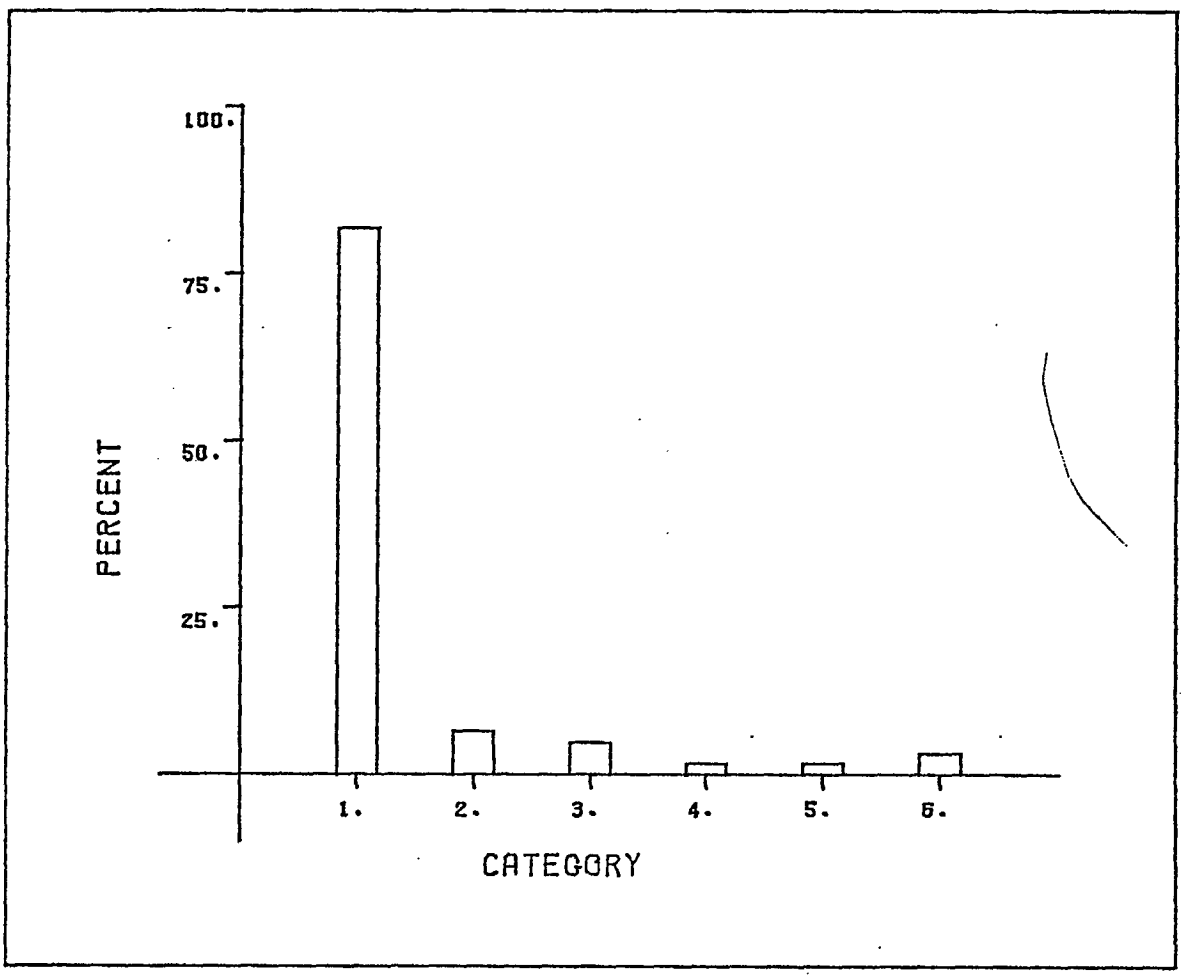


Table 4.2

The most important initial source of finance

	No. of firms	%	Cumulative %
1. Personal savings	49	81.7	81.7
2. Banks and other external sources	4	6.7	88.4
3. Combination of above	3	5.0	93.4
4. Shares issues	1	1.7	95.1
5. Parent company	1	1.7	96.6
6. Do not know	2	3.3	100.0
TOTAL	60	100.0	

Source: Interview inputs.



are exceptions to this rule. A notable one is when an individual becomes a specialist in forming enterprises. Mr. Ed Davis of Calgary[8] is an outstanding example of this kind of entrepreneur. He has set up and sold some 12 different successful enterprises.

Table 4.1 stresses the crucial role of the entrepreneur as a decision-making agent in the small business. According to the inputs we obtained, 47 chief executives, or 78 percent of the total interviewed, were in position to make entirely independent decisions concerning their business. In one instance only - an affiliate of a large corporation - the manager had no independence at all in this respect. In the remaining cases the managerial function was shared, to a varying extent, by a small group of associates although formally there was one manager or the enterprise was linked to a few firms in a joint venture.

The chief executive as capital supplier and financial risk-taker

When starting his business the entrepreneur must provide the required seed capital. The most common source of it are the personal savings of the founder but this finance may be supplemented with that of the associates, relatives and friends of the venturer.[9]

Table 4.2 records the cases in which the founder of a new business provided his own private capital. As many as 49 respondents stated that all, or a major proportion, of the seeding capital came from their personal savings. The most important other source was the banking finance. However, this source was indicated by only 4 percent of the

total responses. When a firm is being set up, it a nonentity in the eyes of the external financier until and when it will prove its viability. In other words, a new enterprise is a high-risk investment for banks and other financial institutions which do not go into this kind of venture.[10] Hence, the founder must provide his own venture capital and at his own risk. As the seeding funds are often accumulated by the founder over the period of his previous employment with large corporations, it would thus appear that the majors in the industry indirectly fulfill two important functions for the benefit of the small firm sector. As we have seen earlier, they are a training academy for the future managers of small firms. We note now they also assist the founders of independent businesses by providing them with an opportunity to accumulate funds for the seeding capital of their enterprises.[11]

Since the entrepreneur-founder supplies the equity capital for his firm, he becomes its sole owner. And, in virtue of the fact that he makes the decisions of how and where this capital is to be invested, he is also the investor and risk-taker in his business. This multi-functionality of the individual underscores dramatically the enormous commitment and involvement he has in his enterprise. He is its founder, manager, owner, financier and risk-taker.

This circumstance would explain why the risk taken in small enterprises tends to be initially moderate and very carefully assessed. This cautious approach should not be misinterpreted because it stems not from a risk-aversion of the founder, rather, it is the consequence of the fact that he invests his own capital which, more often than not, is not in large volume. Should this capital be lost due to a recklessly high-risk

venture, this may mean the end of the independent business career, perhaps for good. To put it differently, at the early stage of the new business's life there is but one step toward bankruptcy if unduly large risk is taken.[12] Since the return on capital is in general positively related to its risk, it follows that an infant small concern cannot expect a high return on this factor of production.[13]

The aforementioned functional multiplicity of the entrepreneur exerts a positive impact on the efficiency-use of resources. In effect, a very strong incentive is generated to use all the resources of the business as efficiently as possible.[14] An additional incentive towards maximum efficiency derives from the fact that the manager's income stands in direct relation to the profit or loss of his enterprise. In sharp contrast, an executive of a large corporation has not invested his own capital in the firm and is paid a fixed salary. He would thus appear to have a weaker incentive to efficiency than the owner-manager of a small firm. Whereas the latter identifies himself entirely with his business - he is the business - the former is essentially a paid employee.

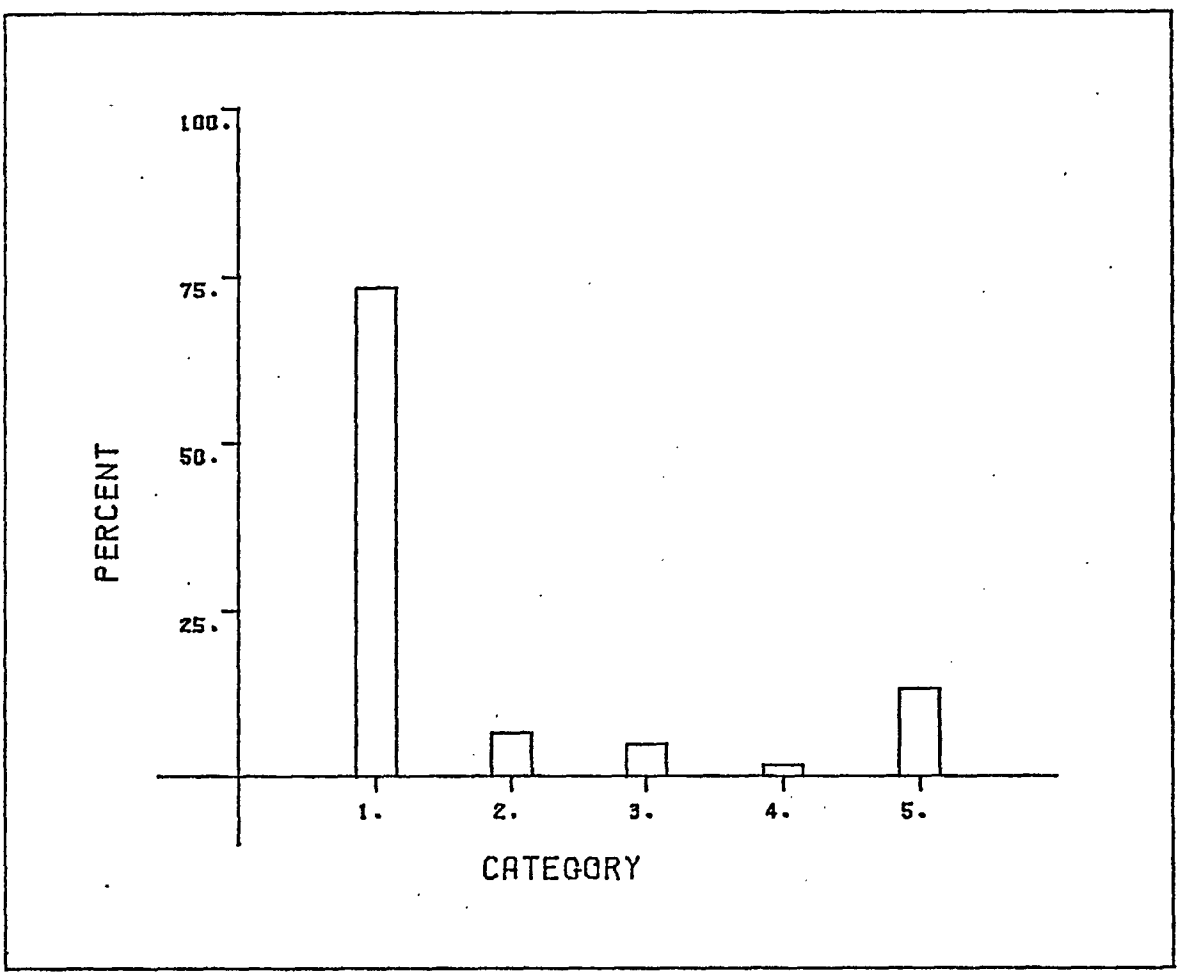
Our enquiries suggest that many small firms tend to use their internal financing whenever possible.[15] External finance may be costly, its terms onerous, hard to get and slow to come.[16] Moreover, it may entail a loss of independence because the supplier may impose constraints on the operations of the borrower. Thus if a small enterprise generates adequate cash-flows it will not go outside in search of extended finance.[17] And if this is not the case, it has flexibility to adjust to some extent, because, to reiterate our earlier comments, neither the owner-manager nor

Table 4.3

The most important current sources of finance

	No. of firms		Cumulative %
1. Cash from production	44	73.3	73.3
2. Parent company	4	6.7	80.0
3. Bank	3	5.0	85.0
4. Shares	1	1.7	86.7
5. Combination of above	8	13.3	100.0
TOTAL	60	100.0	

Source: Interview inputs.



his associates expect a predetermined return on their investments in the short run. When things get really rough, the manager will take what is available and the partners will be content with less than a good return or nothing. And whatever cash-flows, if any, are available will be reinvested and the business will do without external finance - anyway, when things go wrong the firm is not likely to get external financing.

The data in Table 4.3 show the reactions to the question: What is the main source of finance of your firm at present? In 44 cases, the principal source of finance were the funds generated from current operations. Bank loans were relatively unimportant - only 5 percent of the respondents stated that this was their major source of finance. Even less important were proceeds from share issues.[18] Finally, the funds obtained from parent companies were a relatively minor source of external finance.

There was evidence in our enquiries that over periods of tight monetary policy, small firms experienced difficulties in borrowing from banks.[19] The terms of repayment of loans were hard and the availability of finance was limited. It would also appear, on some evidence, that banks and other financial intermediaries occasionally discriminated against small firms. However, it is not clear whether refusal to lend money was premised on the small size of the applicant or was a result of its unsatisfactory performance.[20]

We posed the question whether lack of external finance was a serious constraint on the firm's operations. The reaction was negative, indicating that a large proportion of the independents were financially

self-sufficient. But in 30 cases, or exactly one-half of the total, a lack of external funding was identified as a partial constraint. Only in 3 cases was this factor considered as a serious impediment.

The issue of credit-worthiness was frequently stressed. Evidently, a small business which has done very well has no undue difficulties in obtaining extended finance, but, by the same token, it is in a better position to fund its activities from internal sources. A paradoxical situation occurs, namely, when external financing is required in the early stages of operations or during periods of recession, it cannot be easily obtained but when the firm's demand for this finance is reduced because it generates adequate cash-flows, and the industry is booming, this funding becomes readily obtainable.

The venture capital

Many small businesses venture into high-risk projects after the initial teething problems are over and the firm stands firmly on its feet while others begin their career in a high-risk enterprise. There are in the industry relatively low-risk operations, for example, consulting, well servicing, service and supply, and similar. To the extent that the entrepreneur uses high-risk capital, he acts as a writ-minor venture capital company.

According to its general definition, venture capital goes into new projects, takes a high risk and is expected to yield a commensurable return. The capital that has been flowing into the oil and gas industry has often been viewed en toto, or nearly so, as risk capital. In particular, wildcat drilling, new frontier exploration and development of

non-conventional sources of fossil energy carry very high risk.

There are several sources of risk-capital in the industry.[21] The most important supply comes from the large oil and gas corporations which pioneer new frontiers of exploration and recently have been developing non-conventional sources of energy. Some $2.2 billion of risk capital (private and government) went into the Syncrude project. Very substantial investments have also been made in the Canadian North, the Arctic Islands and offshore exploration (probably some $3 billion, altogether). A source of venture capital are Canadian governments, through direct involvement (for example, the Syncrude project), the Enterprise Development Program[22] and, to a very limited extent, the Federal Business Development Bank. During the post-war period venture capital companies have been active channelling private capital into risky projects.[23] The Canadian Stock Markets have enabled institutions and individuals to put their funds into risky ventures. Finally, drilling and other funds have been mushrooming recently as a result of the special incentives that the March 1976 Federal Budget gave to private investors in land, exploration, development and equipment in the oil and gas industry.[24] In what follows, we will briefly examine the salient features of venture capital companies (VCC) and drilling and other funds.

Venture capital companies

Evidently, risk capital has always been available in Canada but for a long time there were no specialized agencies to siphon it out from the economy and to direct it into venture operations.[25] Furthermore,

there were no strong incentives, until recently, for private funds to be put directly into venture projects. It appears, however, that the supply of risk capital in Canada compares favourably with that in the United States (allowing for the relative size of the two countries) and may be larger than it is in the individual developed countries, including the United Kingdom and Western Germany.

An important institution in Canada is the Association of Canadian Venture Capital Companies. Its members must have at least two million dollars of venture capital and must be willing to see their investments diminish gradually as the investee-companies grow. Hence, they do not operate like holding companies.

It is common practice in the venture capital business to invest on a minority basis, from 5 to 30 percent. But a VCC may operate on a majority control basis if it wants to ensure that, when things go wrong with the investee, it will have sufficient power to step in and salvage the situation. While some VCCs are solely or primarily interested in income, others aim at capital appreciation of their investment.

A majority of VCCs tend to invest in situations of growth. Such investments enable them to achieve a return on their equity capital which is in excess of the current cost of funds. If loan money were used, a smaller return would be satisfactory. Also, VCCs go into large volume investments and an investee who has excellent growth prospects is ideal for this purpose. In contrast, government-sponsored capital, which comes from taxation, mostly goes into no-growth prospect companies and is invested in small volumes. The funds of the Federal Business Development Bank are provided by the Federal Government and the interest

the Bank charges on its loans is comparable with that charged elsewhere in the economy on loan funds and it is much lower than the return which an investor of equity capital expects to get.

As VCCs are investing in growth prospects, it follows, they are investing essentially in people - the individuals with exceptional entrepreneurial abilities. The investor is prepared to put his money down because the entrepreneur - an aggressive and ambitious individual - will be able to promote satisfactory growth of his venture. The size of the venture is not of essence as long as it has an excellent growth potential. A VCC may engage, occasionally, in starting a firm from scratch.

When investment is made, a partnership deal is struck between the VCC and the investee - the former becomes involved in the business of the latter. As the investee grows, the participation in its operations by the VCC diminishes and, eventually, the partnership is dissolved. However, if things go awry, the VCC may increase its participation in the business of the investee and in situations of crisis the former may take over the management of the latter.

It is estimated that in 1977 the total investment made by the Association of Canadian Venture Capital Companies amounted to some $30 million. If we add to it the $30 million that were invested in the form of venture capital by the Federal Government through the Enterprise Development Board, the aggregate of $60 million is trivial when compared with the volume of risk capital that has gone into the Syncrude, the Canadian North and the Arctic Islands which, very approximately, amounts to some $5 billion.

Drilling funds

Drilling and other funds are relative newcomers to the Canadian venture capital market. They have been used in the United States for a long time but are a novelty in this country. According to the amendments to the tax law in May, 1976, deductions (write-offs of pre-tax income) are allowed by the Income Tax Law to individuals and non-principal business corporate investors in land acquisitions, resources exploration and development projects on the basis of indefinite carry-forward. More specifically, investments in exploration are deductible up to 100 percent on the expenditures incurred; development, 30 percent; wellhead, flow and other equipment, 30 percent (diminishing balance method); land acquisitions, 30 percent; and manufacturing and processing equipment, 50 percent (effective straight-line method). In addition, there are numerous provisions and clauses which accommodate cases in widely differing circumstances. No doubt, this new incentive, which will be operative for three years,[26] will expand the source of Canadian exploration and development funds.

The effect of the new incentives evidently has been strong, as may be judged by the sudden outcrop of drilling and other funds. It would appear that, at the time of writing, over 30 drilling funds were being offered in Alberta, to mention but a few, "Shelter Hydrocarbons 78-I" (International Gas Limited - Inter City), "1978 Beaufort Sea Drilling Program" and "Beaufort Exploration Limited" (Dome Petroleum Limited), "Wainoco 78 Canada" (Wainoco Oil and Gas Limited) and "DEB Canadian Explorations 1977" (DEB Explorations Limited). It may be of

some interest to outline the principal features of a typical drilling and development fund. For this purpose we selected a small fund: Tika Oil and Gas Fund (HI, Limited Partnership) offered by International Tika Resources Ltd..

The fund offered non-principal businesses and private individuals an opportunity to make a direct resource investment in the Western Canadian oil and gas industry. The investors will be allowed by the Federal Income Tax Act to take a 100 percent pre-tax deduction from income for incurred Canadian exploration expenses. In addition, all low risk development expenses will be eligible for a 30 percent per annum, declining balance, pre-tax deduction. The Company offered limited partnership interests for sale to the public to the amount of $800,000. There will be 16 limited partners with a minimum investment of $50,000 per unit. Each unit will entitle the investor to a direct working interest in each prospect equal to the percentage of his investment to the total fund.

The Fund is considered by the general partner to be a speculative investment at a high risk because of the potential economic failure of any exploration program. However, the chances of economic failure are greatly reduced when a diversified program is carried out. The joint venture had a four-pronged program as follows: Seismic exploration and seismic data acquisition, land acquisition, exploratory drilling and development drilling. Also, the general partner has had a good record of productive wells. Over the 15 months preceding the offer, eight exploratory wells were drilled and seven were completed as new gas producers. On the basis of this record, the general partner entertains

the expectation that the return on the limited partner's investment would be "reasonable".

In the event of one or more successful wells in Alberta where production income would be received, the limited partner will be allowed to deduct an earned depletion and a 25 percent resources allowance. In addition, the investor would receive a refund of a portion of royalties from the Alberta Government, thereby reducing his tax rate on resources income to approximately 33 1/3 percent average as opposed to 60 percent on his ordinary income (maximum personal tax rate in Alberta).

The general partner will have an unlimited liability in the operation and management of the partnership while the partner will have his liability limited to the amount of his capital contribution plus the pro rata share of the undistributed income of the partnership. The general partner will incur resource expenditures on behalf of the partnership. Also, depending upon circumstances, the general partner may be the operator of the partnership property. The working interest acquired by the parties as a result of the carrying out of the program will be owned by the company and limited partners to the extent of, respectively, 35 and 65 percent.

We have highlighted some more relevant aspects of the above prospectus. The many drilling funds that are offered by both small and large corporations in Alberta have common features though they differ substantially in detail.[27]

The minimum unit that the investor must subscribe varies considerably - it may be as low as $5,000 or as high as $50,000 or more. This creates a problem for the individual who is not able to invest

a large amount of money. A common practice is for a group of interested individuals to pool their resources so that, together, they can come up with the minimum required. Engineers, accountants, lawyers, doctors, university professors, and others, organize consortia of subscribers and share the costs, benefits and losses in proportion to their individual financial participation. Alternatively, a group of investors may form a fund of their own. For example, acreage funds are common. Their purpose is to acquire oil and natural gas leases and they usually work together with one or more principals in order to command the necessary expertise. A typical acreage fund acquires wildcat or random lands by submitting "stink bids" at the regular land sales hoping that it will pick up some cheap leases with good prospects. Also the fund may go for good quality leases which are then thoroughly investigated and for which competitive bids are submitted. The land acquired by the fund (leases, permits, licenses or drilling reservations) may be, subsequently, sold or farmed-out or may be retained by the fund itself and developed independently.

We have not been able to obtain an estimate of the percentage that the drilling and other funds represent of the total venture capital going into the Albertan industry. It is, of course, very small, but the idea seemingly has caught fire.

Invention and innovation in the small firm

In addition to the functions, already discussed, that the chief executive of a small independent performs, he may also make contributions to innovations.

Invention has been defined as an idea of "doing things differently,"[28] and innovation as the new product, service, technology, energy, raw materials, and so on. Innovations are the final outcome of the original inventions, however, many inventions never become innovations. The transition from an idea to the final innovation entails its testing, construction of prototypes, engineering, and designing the product, tooling, manufacturing and marketing. This process may be very costly when frontier technologies are involved. Not surprisingly, such innovations are introduced by large corporations and governments who have the required resources. The most eminent exponent of the entrepreneur in his role as inventor and innovator is Professor Joseph Schumpeter.[29] The Schumpeterean entrepreneur, who is the most important driving force of the free capitalist system, organizes business, raises the required capital and invents and innovates, thus advancing the system's technological frontiers.

It would appear that, historically, most innovations have been made by single individuals or small groups of individuals. Some recent studies, which have been made for the industries other than oil and gas, conclude that small businesses make important contributions to innovation in our modern economy.[30] Our findings for the petroleum industry, based on the information we obtained from our interviews and other sources, do not accord with this result.

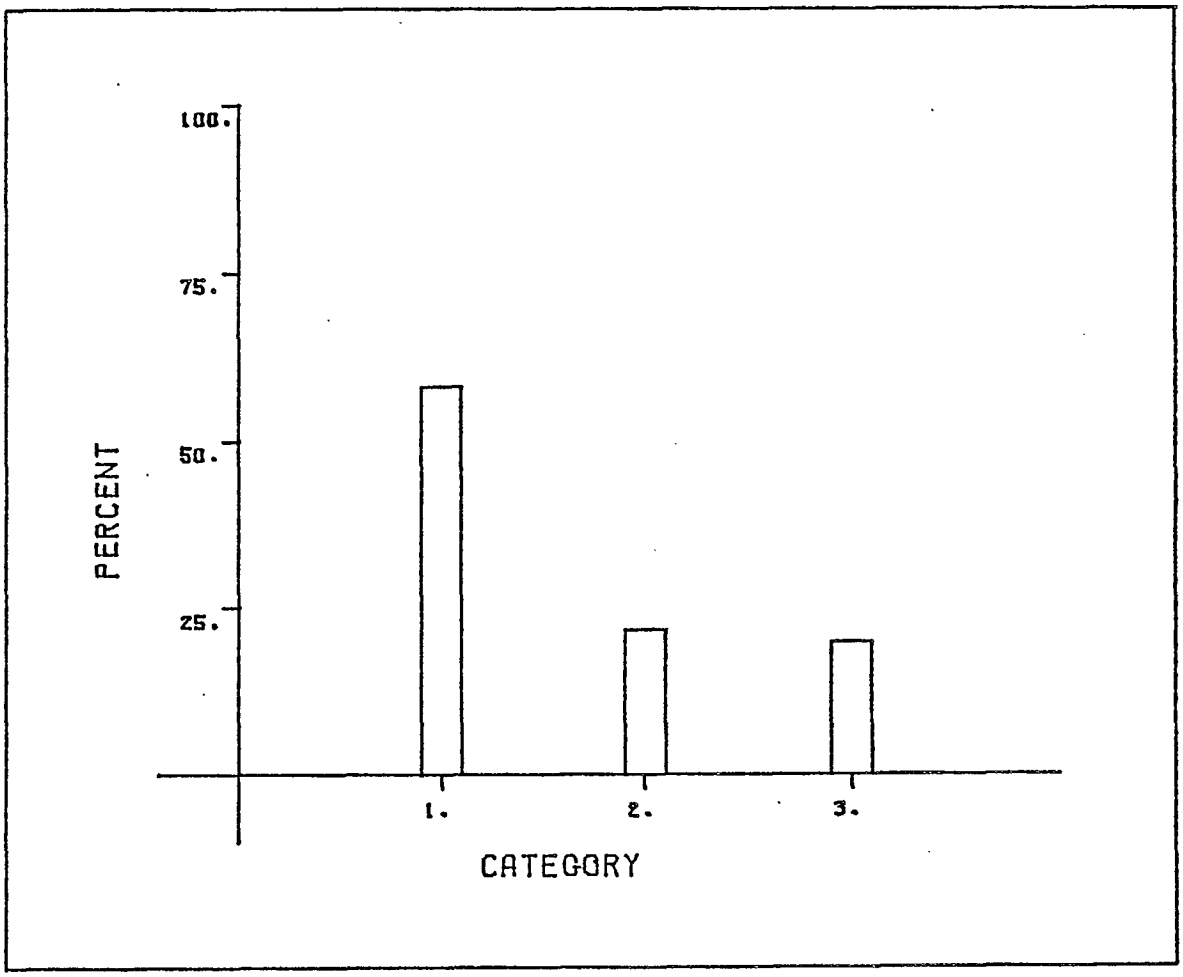
We asked questions whether the firm has made any innovations that were patented by it. We were also interested to learn about the cost of such innovations, their date and description, and the name of the inventor. Mostly, we went away with scanty information because the

Table 4.4

Innovations

	No. of firms	%	Cumulative %
1. "In-house"	35	58.3	58.3
2. Modifications	13	21.7	80.0
3. New products, services, etc.	12	20.0	100.0
TOTAL	60	100.0	

Source: Interview inputs.



businessmen interviewed did not have the required details although almost invariably they were of the opinion that small enterprises make important contributions to innovation in the industry. However, the specifics were lacking.

As seen from Table 4.4 most respondents - 58 percent of the total - indicated that "in-house" innovations had been made in the past. This type of innovations consists of changes in the techniques of operating business. A great deal of inventiveness and innovativeness comes into play when new business is set up and kept going. All this effort is best summed up under the caption of "running the business". Constantly new ideas for improvements germinate in the mind of the manager and are subsequently implemented to improve the efficiency of the firm. They are entirely internal to it and only very seldom see the patent office.[31] Internal innovations are usually inexpensive changes unless they involve, as they do at times, acquisitions of new machinery and equipment (computers). Moreover, they are within the capacity of the expertise already commanded by the firm, hence, there is no need to employ additional scientific and engineering talent.

Next, 22 percent of the respondents pointed to the improvements and modifications they made occasionally to the machinery and equipment used by them. The cost of such innovations varies considerably from one instance to the next but, on the whole, they tend to be relatively low cost, hence, the expenditures on them are within the reach of the limited resources that a small firm commands. It would appear that only on rare occasions are these engineering improvements and modifications

patented.

Concerning entirely new products and services, some responses were very significant, for instance: "We have no time and money to make this type of innovations because we are busy running business." However, 12 executives indicates that their firms actually worked on innovations of this kind. Some were already patented, some were in the process of being patented and the rest were at different stages of "knocking the ideas into marketable outputs." Most of these innovations were made by individual businesses but in some instances it was a joint effort among a few small firms or a joint venture with large corporations. We give below a few such innovations.

(1) The fire flood technology which improves recovery of Lloydminster crude from an average of 7 percent to 30 percent on an economically feasible basis.

(2) A pig - a rubber ball for cleaning pipelines.

(3) A self-mobile rig which can be transported from one drilling site to another without the use of a mobile rig platform.

(4) A new method of processing seismic data.

(5) A new method of drilling. The drill stays down longer and results in less tripping time.

(6) A pumping unit for heavy oil (a triple reduction gearbox).

(7) A new system of well evaluation and testing.

(8) A new separator of fluid from gas.

(9) A new design of more powerful (rig) motors.

(10) A new type of tubing and casing.

Apart from interviews we also used the University of Calgary computer (TULSA and WOI data base) to obtain information on the innovations that have been made in the recent past in the oil and gas industry by individuals or small firms. Several innovations were recorded in the computer output, however, by comparison with those that were credited to large corporations, small firms and individuals were responsible for a very small percentage of the total. Some instances of the contributions made by individuals and small firms were: anti-oil slick licker, oil recovery using steam chemical drive fluids, an improvement in the technique of pipelining crude oil and tars (containing dissolved natural gas at sub-freezing temperatures in order to avoid environmental damage), a method of transporting particulate solids by pipeline, a fluid process in the recovery of hydrocarbons from tar sands, and so on.[32]

Our general impression is that small businesses make more frequent contributions to service - innovations rather than to product - innovations. We will cite but one interesting example of the former. Cottrell Survival Consultants (Calgary) has recently introduced a new Arctic service. The Canadian Petroleum Association estimates that petroleum companies had about 2,400 employees working in the North during the busy 1975-76 season. The higher risks presented by the harsh climate and isolated job sites created a demand for training for cold weather survival. The company, which is a two-man firm (Vern Cottrell and Dave Young), saw the opportunity and filled the existing gap. It is training about 1,000 oil industry workers and federal government employees in the techniques of Arctic survival and offers advice on survival equipment to be carried in aircraft flying in the North over

Table 4.5

R and D expenditures

	No. of firms	%	Cumulative %
1. None	53	88.3	88.3
2. Some	7	11.7	100.0
TOTAL	60	100.0	

Source: Interview inputs.

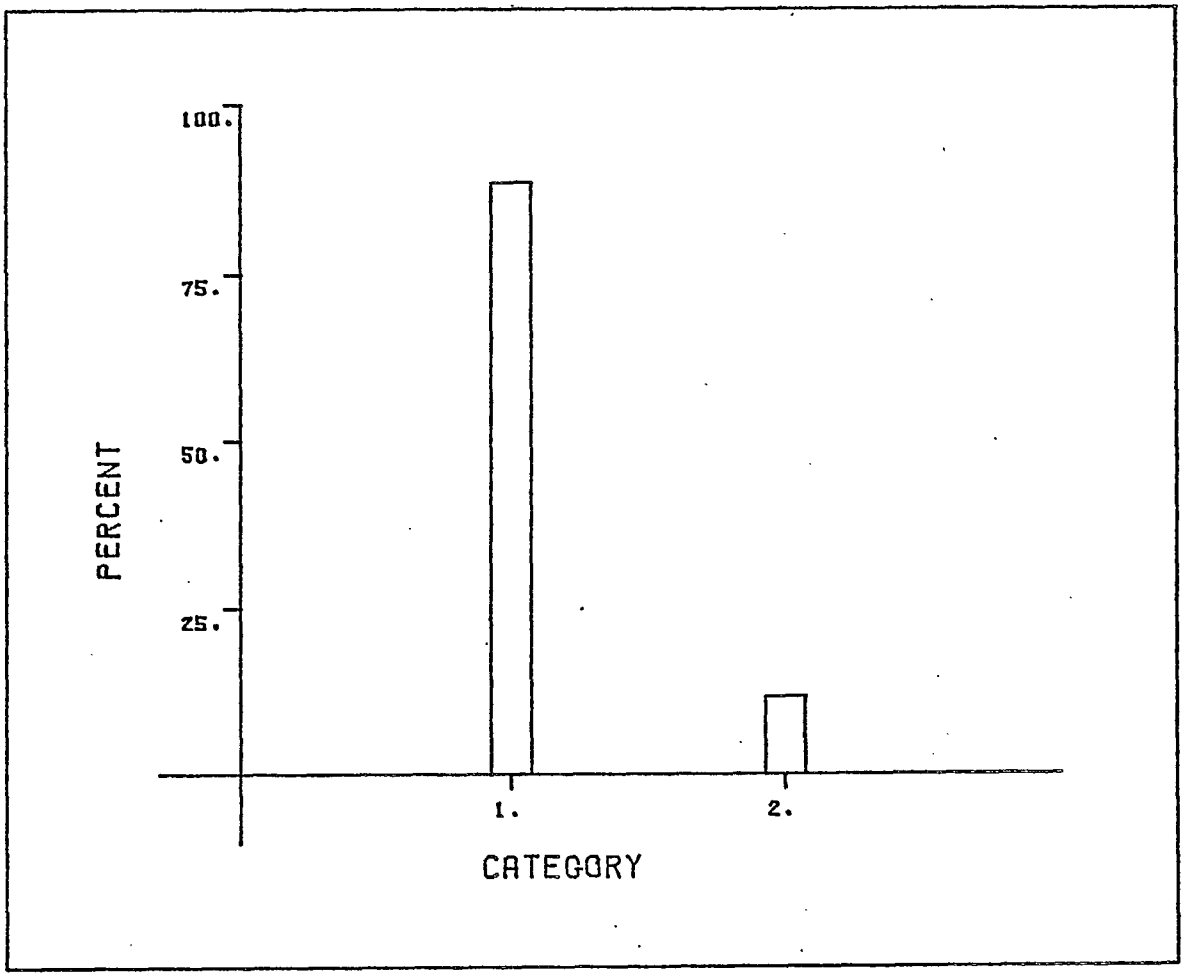
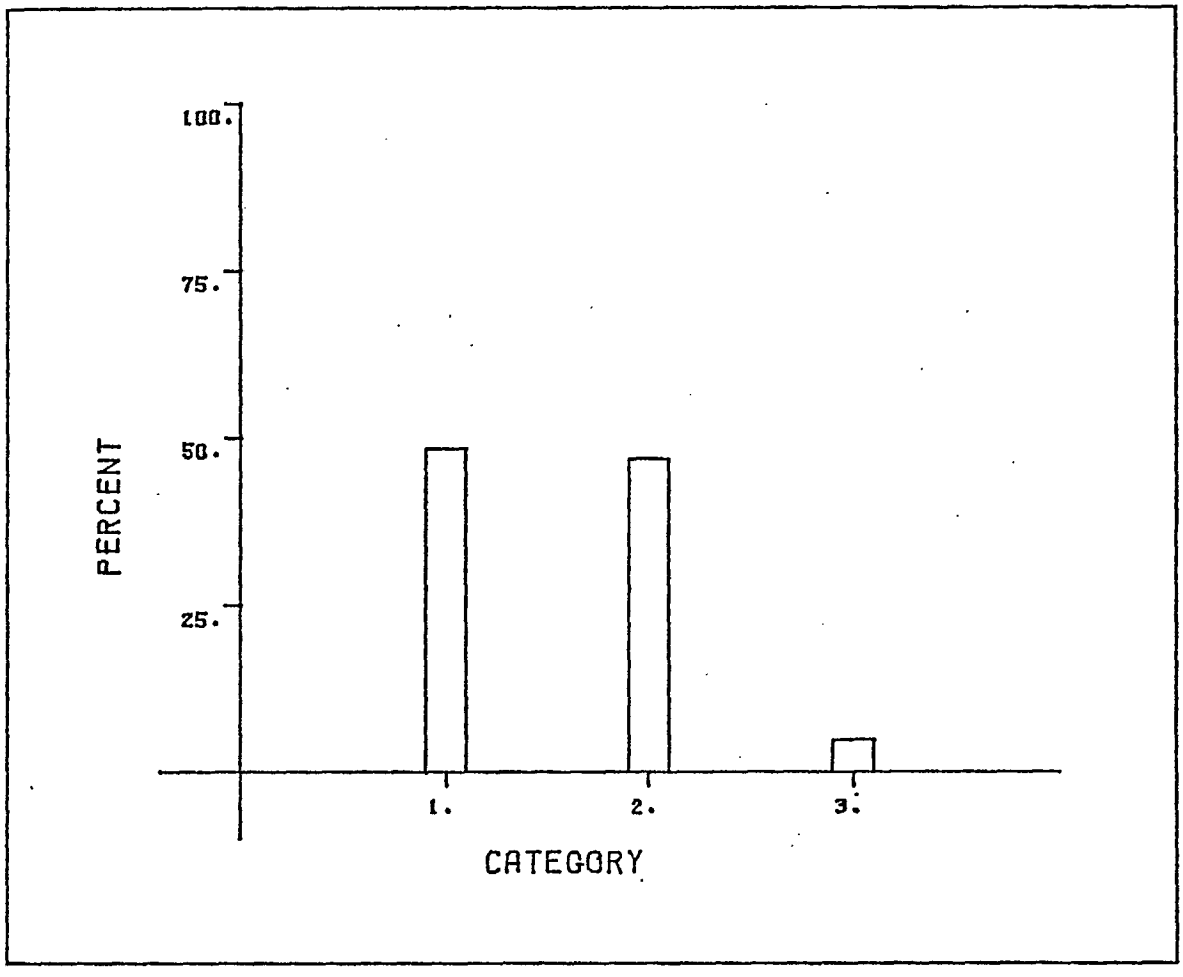


Table 4.6

The most important reason for absence of R & D expenditures

	No. of firms	%	Cumulative %
1. Supply from majors	29	48.3	48.3
2. Lack resources, time	28	46.7	95.0
3. Do not know	3	5.0	100.0
TOTAL	60	100.0	

Source: Interview inputs



long distances.[33]

The twin concepts of invention and innovation parallels those of research and development. The expenditures on research generate ideas and those on development convert the ideas into final marketable products. Hence, any firm that incurs regular and sizeable expenditures on R&D is likely to contribute more to innovations than firms who do not incur such expenditures at all.[34] Commonly, R&D activities entail employment of engineers and scientists who devote their effort specifically to generating ideas and engineering them into innovations.

We asked questions regarding R&D expenditures. Table 4.5 records that in 88 percent of all the cases investigated, no sustained and specific expenditures on R&D were incurred. In four instances R&D expenditures were of some magnitude - they were specific but sporadic. In three cases only were these expenditures maintained on a regular basis and in one case did a firm employ a small full-time research and development staff.

Predictably, the next question was, if a firm does not incur expenditures on R&D, what is the most important explanation of this policy? (this question was addressed to the chief executives of all the 60 firms). The results are given in Table 4.6 where it is seen that 28 responses explained this situation by a lack of adequate resources. Typically: "We are too busy running business" and "We need money for business". A small firm is at a definite disadvantage with respect to R&D expenditures because it operates with scarce resources which have higher priority uses. The management of a small firm, which already performs many functions without which the business could not prosper,

let alone exist, must do away with those activities which are not absolutely vital. And research and development expenditures in a small firm are not a sine qua non of its profitability.

As seen from Table 4.6, twenty-nine responses stated that there is actually no need for R&D expenditures in small units because the important technologies used in the industry are mostly developed and supplied by the majors who have the required resources. New technologies eventually become diffused in many ways such as technical conferences and journals. It is all just a matter of time. Technologies also become embodied in people, machinery and equipment and can be purchased in the markets for human capital, physical capital, and product. This is being done every day in the industry by both large and small firms.[35]

Our overall conclusion is that the small firm sector in the oil and gas industry does not make as important a contribution to innovation as this sector does in other industries, judging by the results of the relevant studies. An explanation of this finding probably stems from the fact that the oil and gas industry is relatively more technology-oriented. Seemingly, the contribution that the small firm sector makes to innovation in an industry is inversely related to the degree of its technological orientation. In a less technology-oriented industry, even frontier technology may be within the reach of the small producer. When agriculture was using simple methods of production, the individual farmer was able to make important innovations, but, after the technological revolution in that sector, it transpires, no single break-through innovation has been made by a small producer:

"Were it not for the government and the farm equipment and chemical firms, agriculture would be technologically stagnant."[36] Similarly, when the oil and gas industry was in its infancy and employed what today appear as rudimentary methods, the small firms sector was, presumably, advancing the technological frontier to an important extent. This would explain why, historically, the small firm and the individual were important agents in innovation. Also, it would explain why this sector plays a more important role in this respect in relatively less technologically developed industries than the oil and gas industry. The situation in the petroleum industry today is very much different from what it was years ago. The industry has reached a remarkably high technological plateau over a short period of time, additional technologies being innovated at a fast rate. And the cost of the frontier technologies is so high that it is prohibitive to any but the largest corporations. In consequence, they have become the technological leaders in the industry.[37]

The lone inventor

There is operating in the industry the lone inventor. We feel our discussion of the issue of invention and innovation would be amiss without, at least, a brief reference to this somewhat invisible individual. We are not in position to evaluate the contribution that he has made to the petroleum industry's innovative effort. Neither can we even approximately estimate the total number of lone inventors in Alberta, let alone in Canada .

The lone inventor - commonly a one-man enterprise - leads a dual

life.[38] On the one hand, he earns a professional or other income, on the other, he devotes his time and money to an invention. Individual inventors come from all walks of life and they operate on their own. Mostly, the lone inventor lacks adequate resources, has no selling skills and is ignorant of the routines of the marketplace. Also, he has to fight for recognition. As far as the industry is concerned, he is an unknown entity. But his better mousetrap is a challenge to those who already produce a similar product, hence, his ideas are in peril of being rejected and suppressed. Furthermore, whereas the specialist and large firms receive assistance from governments in their R&D effort, the lone inventor is on his own. At present in Canada there are no special government programs to encourage the individual inventor. The existing government grants and tax concessions are geared to universities and corporations.[39] Mr. Peter Morris, President of Diamco and Petrocraft Products, a Calgary firm, made an interesting proposal to assist the individual inventor. He suggested a personal income tax credit as a reward for innovation and compensation for failure. The costs that would be written off comprise those of pattern search and filing, the prototype and the foregone income of the time devoted to the invention. This tax relief would act as a strong incentive and would be of direct assistance to the inventor. Whereas the present system of taxation allows special income tax write-offs to companies on their R&D expenditures, thus reducing the value of the dollar allocated to these activities, the individual inventor is entirely left out. However, he operates like a very small firm because he incurs specific direct and indirect (foregone income)

expenditures on R&D and takes the risk associated with inventive and innovative ventures. And, like the main executive of a firm, he is the founder, owner, manager, financier and investor in his highly specialized enterprise. Furthermore, since the lone, or semi-professional inventor, lacks financial resources and business expertise, even if he is encouraged to invent through tax incentives, and starts to manufacture and sell his mousetrap, his chance of survival is limited at best. He needs industry's expertise to reach the marketplace. Mr. Morris suggested that each new patented process or product in the individual's hands be given a tax holiday. This would allow the individual, and the company working with him, to allocate net profits from the innovation to its improvement and its market promotion and expansion. The individual inventor would thus be encouraged to work on his own in order to develop patentable innovations and the partner-company would have the incentive to make meaningful deals with the inventor as it would share in his tax-free status on any new product. Until and when appropriate incentives will be allowed, the vast potential for individual invention and innovation in Canada will remain unexplored. And the all too familiar and popular myth that Canadians are poor innovators will not be put to rest.

If the lone inventor goes by himself, the chances are that he will fail. It is hard for him to find an interested partner with resources who would be prepared to take the risks involved - large companies and organizations keep their doors closed against the lone inventor and are often prejudiced against him because he comes with a new idea. Again, when he is entirely on his own, he tends at times to

follow a wrong track by working on an invention which does not stand the test of the marketplace. The search for the right invention is all-important but, it appears, it is often neglected by the individual inventor who is frequently guilty of unrealistic attitudes. According to Mr. Bruce Nodwell, founder and developer of Canadian Foremost Ltd. (Calgary), a peril to which a lone inventor is constantly exposed is an excessive belief that his idea will sell. This obsession has frequently resulted in a considerable waste of time and money, with no result at all.

A private firm, United Inventors of Canada, Calgary, was founded in 1977 to assist the lone inventor in getting his ideas patented and into the marketplace. He can have his idea evaluated by a group of professional technical experts and if it is acceptable it will be patented in Canada and the United States jointly by the inventor and United Inventors. Costs of patenting and getting the patent into the marketplace are paid for by the company and are subsequently deducted from the financial returns from the sale of royalties of the successful patent.

Notes to Section 4

1. See, for example, Everett E. Hagen, On the Theory of Social Change, The Dorsey Press, Homewood, Illinois, 1962, Part III, Sections 9-11.

2. The following interview comments illustrate this point: "I worked with major companies. They tend to see you as a cog in the mechanism of their operations. I was being pushed into a position that I did not want" and "I do not like major companies - too much politics and manoeuvring - I swore I would never work again for a large company. I do not like any nonsense so I started my own company."

3. These issues are discussed by David C. McClelland, The Achieving Society, Princeton, N.J., Van Nostrand, 1961 and Everett H. Hager, op. cit., loc. cit..

4. Personal displacement may be positive (a new market opportunity or an unexpected access to investment funds) or negative (a layoff or unfair treatment).

5. We are indebted for many of the ideas concerning the character and qualities of the entrepreneur to Mr. Edgar H. Davis, President, System Investments Ltd., Calgary, a successful entrepreneur, who has initiated many new businesses in several areas of endeavour. Mr. Davis' paper, given to the conference on Innovation Calgary, 1978, on August 28-29, 1978 (The University of Calgary, Faculty of Management, initiated by Dr. Ed McMullan) provided us with additional insights into this issue.

6. On the occasion of the conference on Innovation Calgary. See also, The Canadian Petroleum Daily News, June 15, 1978 and The Calgary Herald, October 3, 1978.
   Mr. Gray introduced us to the concept of "uncomfortableness", mentioned in the text, which is experienced by the entrepreneur when he ventures into unexplored territories of endeavour.

7. Present President of Canadian Hunter.

8. See footnote 5 above.

9. We would like to acknowledge the assistance we received from Mr. Rick Gusella, Peters and Co. Ltd., Investment Securities, Calgary, concerning the issue of financing of small business in the oil and gas industry in Alberta.
   The problem of financing small business in Canada has been receiving a great deal of attention. See, inter alia, "Financing a small business," CA Magazine, September, 1976; "Financing big problem of small businessmen," Globe & Mail Report on Business, February 2, 1977; "Independent's key to survival: right financing structure," Foodservice and Hospitality, Canada, February, 1976; "Troubles of small firms growth financing cited," Globe & Mail Report

on Business, October 26, 1976 and "Small business finance," Appraisal Institute Magazine, October, 1977.

See, also, "Small Business Financing," in Fundamentals of Financial Management, J.C. Van Horne, C.R. Dipchand and J.R. Hanrahan, Prentice-Hall of Canada, 1975, Part 7.

10. For a discussion of this point, see Report of the Royal Commission on Corporate Concentration, pp. 269 ff.

Besides the risk involved, large commercial lending institutions are also deterred from investing in small business by the relatively higher administrative costs per dollar loaned.

11. Furthermore, many present chief executives of small firms had established important business contacts while employed with the majors in the industry. These contacts were, subsequently, used by these individuals in their own independent business. Finally, the majors also train skilled labour which may eventually be employed by small firms.

12. One, somewhat unexpected, reason for cautionness in investing in a small business was: "I am in the late 60's - I am still mindful of the Great Depression."

Small companies spread risk by embarking simultaneously on several projects or many partners contribute to the capital of the company or both. Another way of risk-spreading, especially in high-risk exploration ventures, is for professionals with well-established practice (accountants, surveyors, geologists, etc.) to become business partners or to work in a small enterprise part-time.

13. In contrast, a large corporation can take a high risk and obtain a high rate of return on its capital. The Royal Commission on Corporate Concentration found that, "For several reasons, as its size increases, a firm's ability and willingness to take on increasingly risky projects also increases" (Final Report, Ch. 3, p. 66). See also, ibid., Study No. 20, Section 3.4.

The Commission observed that the rate of return in large corporations is less variable over time than it is in small business. Hence, large corporations are less risky than small firms are - they have more protection against income randomness.

14. This situation was succinctly appraised by the Bolton Report: "The divorce of ownership from managerial control . . . fails to take advantage of the fact that people instinctively look after their own money more diligently than other people's. It is thus in the social interest that wherever possible the owner of any concern should manage his own resources and that the manager should own a substantial interest in the resources he manages." (Ch. 2.43, p. 23)

15. The Bolton Report discovered that a substantial proportion of small firms do not borrow at all (Ch. 2.14, p. 12). See also, Problems of the Small Firm in Raising External Finance—The Results of a Sample

Survey, Economists Advisory Group (Special Research Study commissioned by the Bolton Commitee).

16. Some entrepreneurs find the search for capital extremely frustrating and time-consuming because of the lack of information concerning the availability of capital, the lack of concern for urgency on the part of lenders, and their overwhelming need for detailed business plans before they ever will consider investing in a venture.

17. Convertible debentures are at times used as a go-between of internal and external finance. If oil and gas are found the value of convertible debentures will go up and they are converted into common stock. The main advantage of convertible debentures is that they allow the entrepreneur to take on some debt and, if he is successful, he discharges this debt because the debentures become the equity stock of the company.

18. In Section 2 of this Study we discussed Professor Galbraith's contention that small businesses, by comparison with large corporations, rely more heavily on external financing. Again, in Section 7 of this Study, our analysis of the annual financial reports of small and large firms indicate that the former borrow more funds than the latter, which, to a considerable extent, finance their operation out of current earnings. In this Section we present evidence that small firms rely importantly on internal sources of capital for financing of their operations. There is no consistency involved because the firms discussed in the present Section are very small, and mostly, young. Larger firms, still small by comparison with the large firms in the industry, if successful in their operations, will extensively use external finance. The small firms of Section 7 of this Study are much larger than the small firms discussed in the present Section.

19. For the view on this matter of John F. Bulloch, President of the Canadian Federation of Independent Business, see, "Small businessmen say banks don't meet all their needs," The Financial Post, September 21, 1974. Comments on this issue were received from 2,400 firms in a cross-country survey of CFIB membership.

20. Apart from private individuals, the banking system is a major source of financing for small businesses. However, banks cannot meet all the financing needs of these units. Bank loans, usually secured by the assets of a business and the personal guarantees of its owners, can satisfy only the relatively low-risk needs.

21. See, J.R. Downs, The Availability of Capital to Fund the Development of Canadian Energy Supplies, Canadian Energy Research Institute, University of Calgary, Study No. 1, November, 1977, especially, Ch. 5; M.J. Needham, "Venture Capital in Canada,", P.E. McQuillan, "Tax Incentives for Venture Capital in Canada,"; R.A. Brown, "Equity Financing in the Oil and Gas Industry" and M.A. Carten, "Financing the Development of Oil and Gas Reserves," in 1976 Conference Report, Canadian Tax Foundation, 1977; Royal Commission on Corporate Concentration, Final Report, pp. 261 ff; P.C. McQuillan and H. Taylor,

Sources of Venture Capital, Department of Industry, Trade and Commerce, Government of Canada, 1977; Russell M. Knight, "The Supply of Venture Capital in Canada," Working Paper Series No. 57, School of Business Administration, University of Western Ontario, London, October, 1971; and "Venture Capitalists Come On With a Rush," Financial Post (October 28, 1972). This report estimated that there are 151 sources of venture capital in Canada; of this total, 37 were venture-capital companies, 22 venture funds, and 10 venture managers. Other sources of venture capital identified in the report were investment dealers and counselors, trust companies, pension funds, insurance companies, and holding companies).

22. The EDP (Department of Industry, Trade and Commerce),which started in 1977 with $87 billion, is designed to invest in firms rather than just assist projects. Its board has six industry representatives to provide a practical, market-oriented outlook. EDP grants are used for developing proposals for projects eligible for assistance; studying market feasibility; projects related to improving productivity; implementation of mass production of existing products; and realizing technological innovation. In addition, loans are provided to facilitate restructuring or rationalization of manufacturing and processing firms by providing last-resort financial assistance. The Program is geared to small business; nonetheless,it does not specify what a small business is. EDP replaced the "alphabet soup" programs (so named because of their acronyms): Program for the Advancement of Industrial Technology (PAIT); Industrial Design Assistance Program (IDAP); Program to Enhance Productivity (PEP); General Adjustment Assistance Program (GAAP); Pharmaceutical Industry Development Assistance (PIDA); Automotive Adjustment Assistance Program(AAAP); and Footwear and Tanning Industry Adjustment Program (FTIAP).

23. Venture capital companies would appear to be the most appropriate vehicle for providing risk capital to small business. For a number of reasons, their activities, however, have been declining in recent years. (One of the reasons were the restrictions imposed by the Canadian Government on the operations of the foreign venture capital companies in this country.) From the viewpoint of many investors, including venture capital companies, investments in small venture activities, by comparison with large projects, generally offer low returns relative to high risks, require greater investments in investigation and research costs, greater need for supervision and are relatively more difficult to divest. In May, 1978, the Honorable A.C. Abbott, Minister of State for Small Business, proposed a Venture Enterprise Investment Company (Improving the Equity Financing Environment for Small Business in Canada, Government of Canada, May 24, 1978). VEIC would mobilize pools of capital and redirect individual and corporate investment flows into high-risk ventures (discussed in The Financial Post, June 3, 1978). See, also, The Royal Commission on Corporate Concentration, Final Report, pp. 271 ff. ("Small Business Investment Corporation") and Improving the Flow of Risk Capital, Research Study, Canadian Federation of Independent Business, Toronto, No. 1976.

24. Canadian taxation does not stimulate the flow of risk capital into new business ventures. The present tax incentives encourage savers to put their funds into such tax shelters as RRSPs, RHOSPs and MURBs, government bonds and insurance funds, rather than into the equity of new ventures.

25. We are indebted to Mr. G.D. Sutton, President, Canadian Enterprise Development, Oakville, Ontario, for many insights into the operations of venture capital companies in Canada. (Private conversation and a talk that Mr. Sutton gave to the conference Innovation Calgary, 1978.)

26. It was extended to 1982 in the November 1978 Budget.

27. There are good, bad and intermediate funds. The success will be determined by the sponsoring company's ability and luck. Those funds that are managed by poor professionals may fail anyway, but the rest - good professionals - may be adversely affected by bad luck. Drilling funds are invariably high-risk ventures.

28. "It is the carrying out of new combinations that constitutes the entrepreneur," Joseph A. Schumpeter, The Theory of Economic Development, Oxford University Press, 1961, p. 75.

29. J. Schumpeter, op. cit..

30. A scrutiny of the relevant literature reveals a lack of consensus. On the one hand, some studies maintain the important role of individuals and small businesses in innovation; on the other, the opposite is contended, that is, it is argued that the big corporation is the indisputable leader in this field. J. Jewkes, D. Sawers and R. Stillerman (The Sources of Inventions, Macmillan, London, England, 1958) concluded that the independent inventor or small business is the source of many significant inventions. Their study also suggests that the role of small firms in innovation is less important than it is in invention, but that it remains substantial and shows no tendency to diminish. According to the findings of the Bolton Report (Ch. 4.34), small firms accounted for some 10 percent of the important innovations over the period 1945-70. The Report noted that this share was more than twice the estimated share of the small firms of R&D expenditure. C. Freeman (The Role of Small Firms in Innovation in the United Kingdom since 1945 (Research Report No. 6, commissioned by the Bolton Commission)) and J.G. Cox (ditto, Research Report No. 2), provided evidence that small firms and individuals continue to make major innovations and that small firms pioneer major new products, even in areas of the most advanced technology. Jacob Schmookler ("Market Structure and Technological Change," in Edwin Mansfield (ed.), Monopoly Power and Economic Performance) found empirical evidence indicating that fundamental inventions are more likely to come from the numerous owner-managed small firms than from the small number of big firms. Many Canadian inventions by individuals and small firms are given in J.J. Brown, Ideas in Exile, McClelland and Stewart, 1967

and in J. Jostbakken and J. Humphrey, The Canadian Inventions Handbook, Greey de Penscier, 1976.

However, other studies argue the opposite point of view (see our discussion of this issue and the relevant references in Section 2 of this Study). For example, The Royal Commission on Corporate Concentration (Study No. 20) arrived at the conclusion that the rate of technical progress is greater in a society organized into large firms. P. Johnson ("Policies towards Small Firms: Time for Caution?", Lloyds Bank Review, No. 129, July 1978, p. 11) surmised that the idea that most or indeed all small firms are innovatory and potential challengers to large firms does not conform to reality.

31. It may be of interest to note that some businessmen were not aware of their own innovative effort. The following extract from an interview will illustrate this point: "We invented a pig - a rubber ball which goes through the pipeline and cleans it off - you put tungsten studs in the pig. I do not look at it as an innovation. It is something that makes our job easier."

32. We were in position to identify several inventions made recently by small firms or individuals. Our list, of course, is not comprehensive and details are missing. Dr. R.A. Ritter of the Alberta Oil Sands Technology and Research Authority invented a method of reducing the size of huge tailings ponds at oil sands plants; Jan Kruyer of the Alberta Research Council invented a potentially revolutionary oil sands recovery process (his oleophilic sieve process is superior to the hot water extraction process now used in the oil sands, The Calgary Herald, March 22, 1978). Abacus Engineering and Machine Ltd. (Calgary) developed a new robot internal pipe painter and ice chipper for use in Arctic exploration (The Calgary Herald, February 15, 1977); Eastman's research and development engineers devised the DOT, a computer system to give a continuous picture of bit heading, hole direction and drift angle (The Canadian Petroleum Daily News, June 15, 1978); Reed Tool Company came up with a revolutionary bit (FP-51). This bit will drill as fast as the tooth type but will stay in the hole longer (The Canadian Petroleum Daily News, ibid.); Canadian Fracmaster Ltd. produced a truck equipped with machinery to stimulate oil and gas wells (The Calgary Herald, March 10, 1977); and a new and radical innovation in the detection of sulphate reducing bacteria by Cormetrics Ltd. (The Canadian Petroleum Daily News, ibid.).

33. The Calgary Herald, September 11, 1978.

34. Two studies: D. Hamberg, "Size of Firm, Oligopoly and Research: The Evidence" (The Canadian Journal of Economics and Political Science, February, 1964) and Edwin Mansfield, "Size of Firm, Market Structure, and Innovation" (Journal of Political Economy, December, 1963) found that the largest firms spent less on R&D, as a percentage of sales, than somewhat smaller firms. Another study by Mansfield (Industrial Research and Technological Innovation, New York, W.W. Norton, 1968)

provides evidence that the number of significant inventions carried out by the firm (in chemical, petroleum and steel industries) seems to be highly correlated with the size of its R&D expenditures. Furthermore, increases in R&D expenditures result in more than proportional increases in inventive output in chemicals but not so in petroleum and steel industries. See, also, J.D. Howe and D.G. McFetridge ("The Determinants of R&D Expenditures," Canadian Journal of Economics, Vol. IX, No. 1, February, 1976) where the relationship between firm size and R&D intensity was studied (inconclusively).

35. An interesting comment was made by an executive on the diffusion of technologies in the industry: "The majors move into new areas and that gives them a jump on the market and a running start but most technologies become available to the whole industry."

36. J.K. Galbraith, Economics and the Public Purpose, p. 49.

37. E. Mansfield concluded as follows: "Thus, if the Schumpeterean hypothesis is taken to mean that the largest firms accounted for a larger share of the innovations than of the market, it seems generally to hold in petroleum and coal but not in steel." The Economics of Technological Change, Ch. IV, Section 6, p. 110.

38. We are indebted for many ideas regarding the lone inventor to Mr. Peter Morris, President, Diamco and Petrocraft Products (Calgary) who gave a paper to the conference Innovation Calgary, 1978 and, subsequently, discussed several issues with us.

39. See, Robert H. Grasley, The Availability of Risk Capital for Technological Innovation and Invention in Canada, Ministry of State, Science and Technology Report No. 6 (Ottawa, Sept. 1975).

SECTION 5

GOVERNMENT AND THE SMALL FIRM SECTOR IN THE PETROLEUM INDUSTRY

A section of our questionnaire dealt with the impact of government policies on small firms. The answers to many issues that were discussed in our interviews echo a dissatisfaction and frustration of the small business community with government policies towards the industry over the period 1973-1976. A struggle between Ottawa and the Government of Alberta for a larger share of the petroleum revenues created an almost unique situation of disincentives to exploration in the history of the industry.[1] In 1976 there occurred a virtual reversal in the government policies in general and several new measures have since been introduced to assist the small business.[2]

The November 1978 Federal Budget extended the incentives for oil and gas drilling funds to December 31, 1981, from its scheduled expiry date of June 30, 1979. We discussed in the last Section the beneficial effect of this measure on the flow of private risk capital into the industry. A special R&D tax credit of 25 percent was introduced for small business corporations. This provision is likely to stimulate R&D expenditures in those small business which hitherto have not been incurring them on a regular basis and it will be a strong incentive to increase these expenditures in the small enterprises which have been engaged in some R&D. The budget introduced a new definition of small businesses who may qualify for the favourable small business tax rate which is some 20 to 21 percentage points lower than that on larger

corporations, on income up to $150,000 per annum. This change will ensure that the incentives will serve their original purpose of promoting small business expansion and not be used as a tax shelter for personal, professional and investment income of individuals. The investment tax credit, which supports industrial expansion and modernization was extended indefinitely beyond its scheduled expiry date of June 30, 1980. And its basic rate was raised from 5 to 7 percent and extended to investment in equipment for rail, air, water and long-haul road transport. Although this measure is not specifically designed to benefit small businesses, it will afford gains to it directly and indirectly.

Some earlier changes comprised initiatives to reduce the burden of paperwork on small business. Changes were implemented also in government procurement policies. Until May 1978, about 40 percent of government purchases were from small business but that figure will be gradually increased. A program to subsidize the hiring of university graduates will provide smaller firms with the ability to take advantage of students' specialized training. The program would subsidize salaries for the first year of employment only. A bill was introduced to eliminate capital gains taxes for heirs and key-man employees on family owned small business. Thus, the legislation of May, 1978 permitted free-tax transfers of small business holdings from a parent to a child or grandchild. It allows a deferral up to $200,000 in capital gains when shares of an incorporated small business are transferred between generations of a family. The $200,000 is a lifetime maximum whether the shares are transferred during the taxpayer's lifetime or at death. The measure is not an exemption from capital gains tax. Gains will be taxed in the hands of the children

or grandchildren on any subsequent sale of the shares unless the subsequent sale qualifies for rollover treatment. The deferral applies to shares of Canadian-controlled private corporations which are engaged in active business operations. Qualifying small businesses will be those whose property consists substantially of assets used in a manufacturing, processing, mining, logging, farming, fishing, construction, wholesaling, retailing or other business, or shares and debts of another small business corporation.

In 1976, several of the programs of the Department of Industry, Trade and Commerce in support of innovation and industrial adjustment were merged into one - the Enterprise Development Program - which has a primary focus on the support of smaller and medium-sized companies. Under the EDP, the Federal Government provides direct grants for innovation and insures loans by private lenders, such as chartered banks. The lending capacity of the Federal Business Development Bank was increased to assist small business. Term financing through the chartered banks will be more readily available as a result of recent changes in the federal Small Business Loan Act. Federally guaranteed loans at a rate of 1 percent above prime rate will ease significantly the debt financing problems of small business.

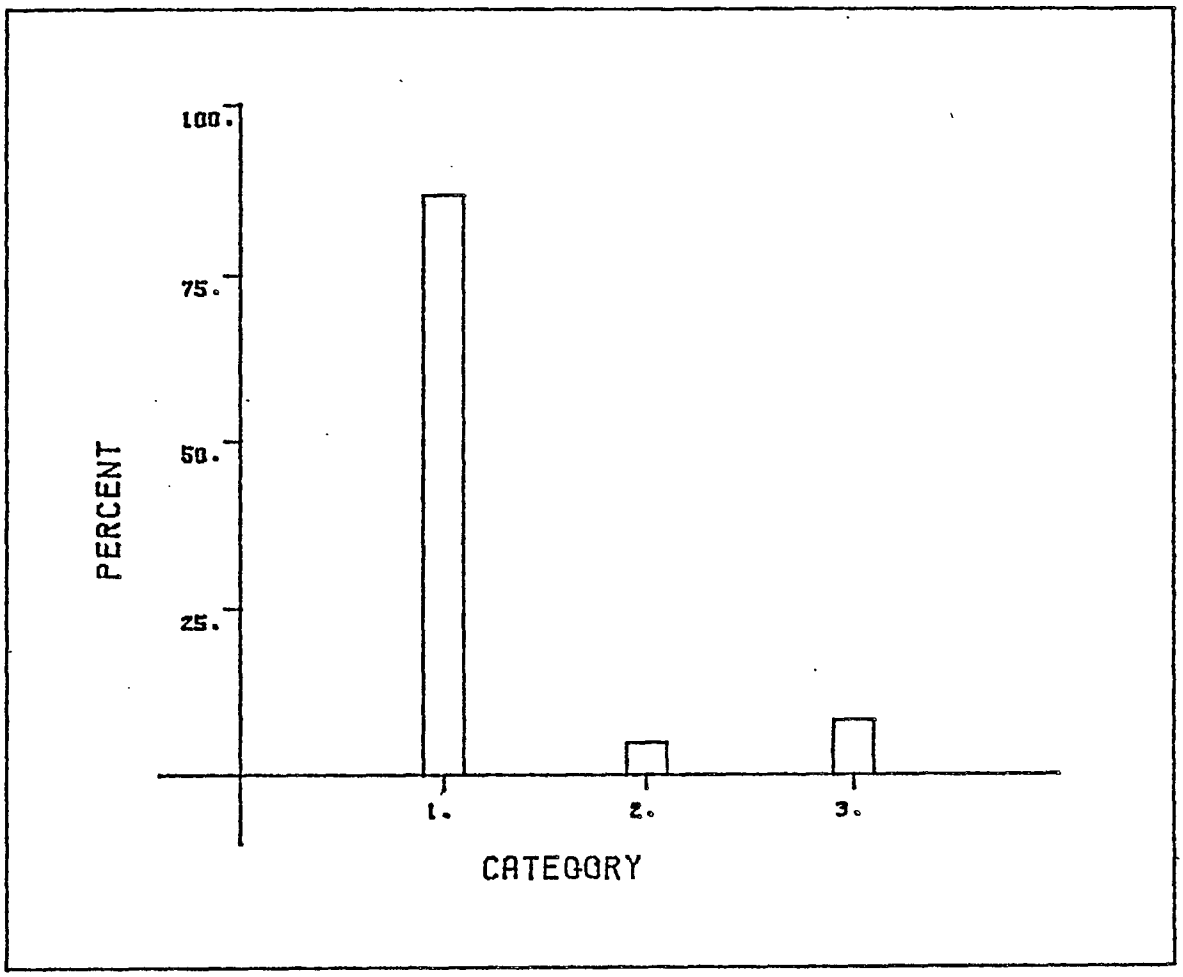
In September 1977, the Minister of State Small Business, the Honourable A.C. Abbot, announced the Federal Government's strategy for small business. This report included considerable discussion on the financing concerns of small business. It noted, in particular, the government's commitment to examine ways to improve the equity financing environment for small business. In May 1978, the Honourable A.C. Abbot

Table 5.1

Degree of government intervention (1973-76)

	No. of responses	%	Cumulative %
1. Excessive	52	86.7	86.7
2. Neutral	3	5.0	91.7
3. No comment	5	8.3	100.0
TOTAL	60	100.0	

Source: Interview inputs.



presented proposals for the Venture Enterprise Investment Company which would be specifically designed to stimulate the flow of equity capital into small enterprises for their growth, expansion and modernization ensuring, at all times, maximum participation of private financing sources.

The incentives for resource drilling and exploration, which allowed an individual or corporation to immediately deduce expenses incurred, has been extended to December 31, 1981, from June 30,1979. Finally, a new amendment to the federal Income Tax Act allows investors in small businesses to write off losses against other income and as the taxation of dividends was reduced, owner-managers of small business will enjoy tax savings in replacing salary and bonus arrangements with dividends.

As seen from Table 5.1, nearly 87 percent of the respondents alleged that, after 1973, government interference was on the increase and became excessive in the sense that it unduly inhibited the free enterprise system in the small firm sector. Three individuals stated that the situation was neutral, and in five cases no comments were volunteered on this issue. The point was emphasized throughout that the interference by the Provincial Government was less than that of the Federal Government and that the Alberta Government made attempts to countervail Ottawa's policies, thus somewhat redressing the situation.

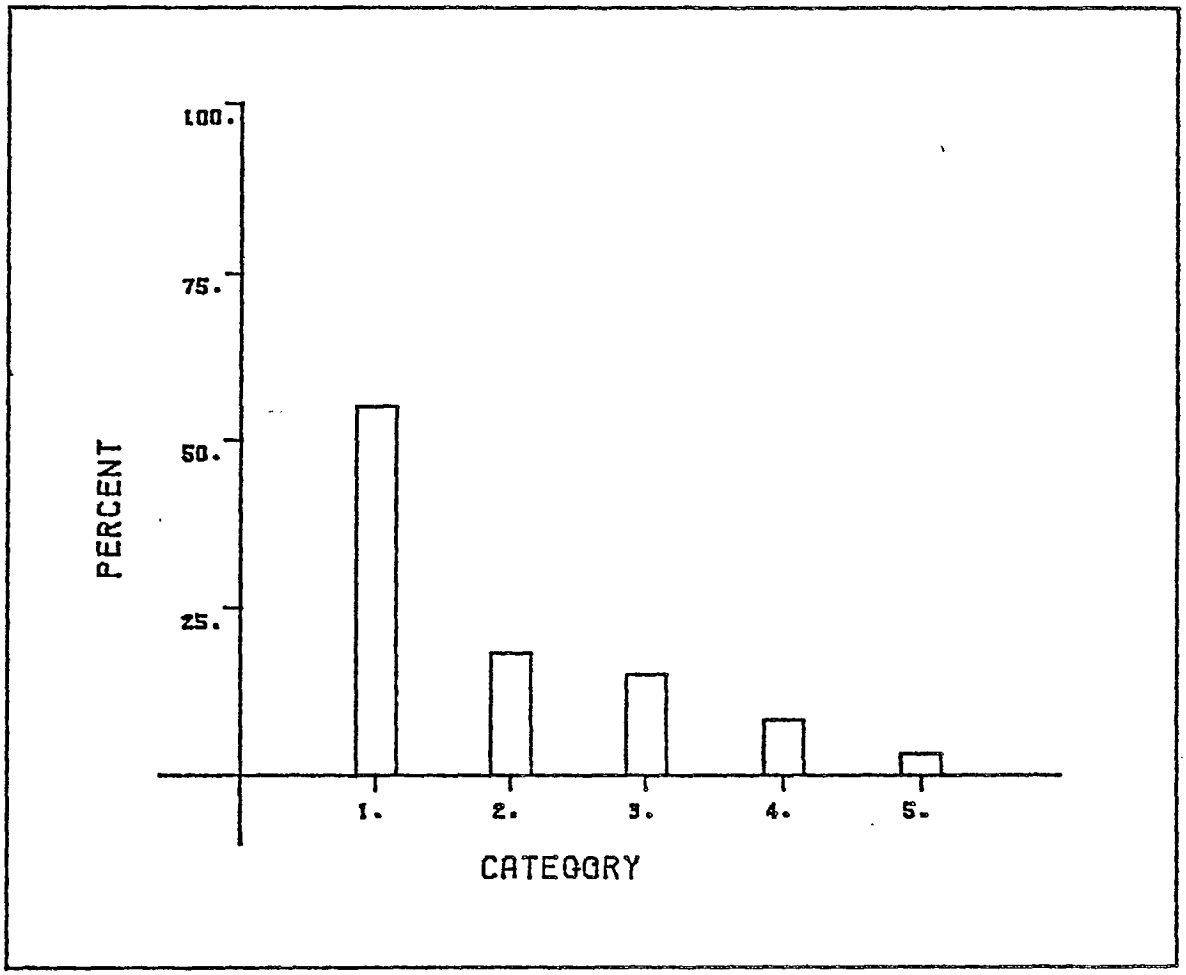
Professor Schumpeter in his seminal work on the entrepreneur introduced the concept of "social climate". This complex phenomenon encapsulates social, political and economic parameters of the environment in which entrepreneurs operate.[3] The climate includes social

Table 5.2

Business climate (1973-76)

	No. of responses	%	Cumulative %
1. Discouraging	33	55.0	55.0
2. Indifferent	11	18.3	73.3
3. Hostile	9	15.0	88.3
4. Favourable	5	8.3	96.6
5. No comment	2	3.3	100.0
TOTAL	60	100.0	

Source: Interview inputs.



values at a particular time, the class structure, the educational system, and the like. It also comprises the attitude of society toward business success, and the nature and extent of the prestige, and other rewards, which accompany it. A particularly important factor is the entrepreneur's understanding of the "rules of the game", namely, the fiscal and monetary constraints under which he must operate. Sudden changes in these rules create uncertainty and are deleterious to enterprise. Government policies can influence social climate in many ways. In general, the climate is favourable when entrepreneurial success is adequately rewarded and the rules of the game are well known and, furthermore, do not undergo frequent, sudden and unannounced alterations. But when the returns on the entrepreneur's capital and talent are drastically curtailed and the rules of the game are obscure and subject to frequent changes, the climate may become unfavourable, even overly hostile.

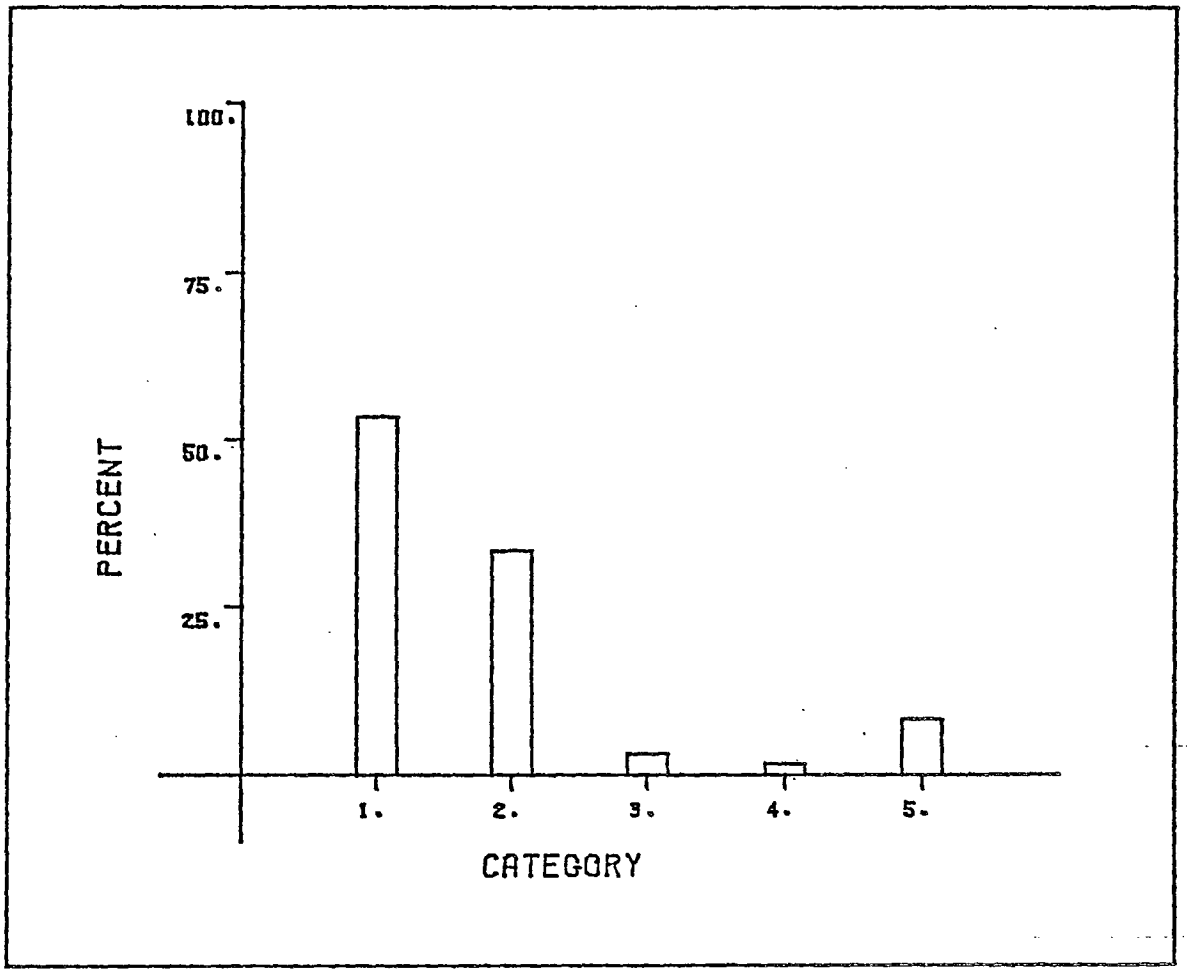
Table 5.2 provides some information on the business climate. Sixteen respondents (27 percent of all reactions) indicated that it was either indifferent or favourable. Thirty-three responses were that it was unfavourable and nine that it was outright hostile.[4] Thus, altogether, 70 percent of all the executives interviewed expressed either a strong or a very strong condemnation of government official policies. The firms in exploration, development and production of oil and gas were directly affected by this poor climate. But all the small firm sector felt its brunt due to a very high degree of interdependencies among businesses. What happens in exploration, development and production reverberates with a magnifying impact throughout the small firm sector.

Table 5.3

Most harmful government policies

	No. of responses	%	Cumulative %
1. Changing rules of the game	32	53.3	53.2
2. Involvement in private enterprise	20	33.3	86.5
3. Double taxation	2	3.3	89.8
4. Poor monetary policy	1	1.7	91.5
5. No comment	5	8.3	100.0
TOTAL	60	100.0	

Source: Interview inputs.



Next, we enquired into the most harmful government policies. It transpires - see Table 5.3 - that repetitive and unheralded alterations in taxes, royalties, income tax write-offs and other measures[5] were identified as the most disturbing by the largest number of respondents - 32 individuals or some 53 percent of the total. It was believed that the small enterprise has enough adaptability and flexibility to cope with even the most adverse climate if the status quo is maintained for a sufficiently long period of time for the elements of the situation in which they operate to be incorporated into longer term business planning. But when the rules of the game change frequently, and in a manner that is hard to predict, enterprises are forced to revise their projected operations. An adjustment to the extant scenario may near its completion, when a new change in the ground rules is announced, and the process of recasting operations into a new die must start again. Given these discontinuities, the entrepreneur cannot with ease forecast his costs and revenues from the projects undertaken.[6] When Ottawa and Edmonton were jockeying for the most advantageous position, this was at the expense of the business because the governments were depriving the industry of the "constants in the planning equation". And "how can you plan if you do not know what you are planning for?"[7] An expression is used in the business to capture all the uncertainty associated with the frequent and unpredictable changes in the official stance - the "government risk". The small business sector thus views itself as being confronted with two different types of risk, viz., the normal risk that is taken by an enterprise in a venture and the risk that government policies may suddenly change without warning, thus upsetting drastically

the projected revenues and costs.[8] In a meaningful sense, the small business is taking a double risk.

The second most harmful policy was the unduly high involvement by governments in the working of the private enterprise.[9] Twenty replies, or 33 percent of the respondents, made this point. If the private sector, so it was argued, is left alone it will do the job it is supposed to do, that is, it will explore for oil and gas and will find it. The task will be done as long as an adequate reward is obtained on the capital, risk-taking, effort, organization and other inputs that the entrepreneur provides in his business. However, this expected normal return was squeezed out by high and rising taxes, royalties and other measures. This squeeze hit small businesses hard by draining their vital cash-flows. As we observed earlier, small enterprises are vulnerable in this respect because they rely on current cash-flows as the main source of finance until and when they become well established in the industry. Hence, when this flow of funds dries up, or is reduced, financial problems arise. A big corporation which deploys relatively large resources is in a much better position to weather off temporary setbacks of this nature. Rising prices of oil and gas, which eventually resulted in a greater slice of the total pie going to the private sector, was a redeeming feature of the situation.

Next, two executives singled out "double" taxation as the most deleterious aspect of government policies while one individual identified the tight monetary policy as the factor in question.

The issue of double taxation arises when a chief executive draws a professional income from accounting, surveying, engineering, legal and

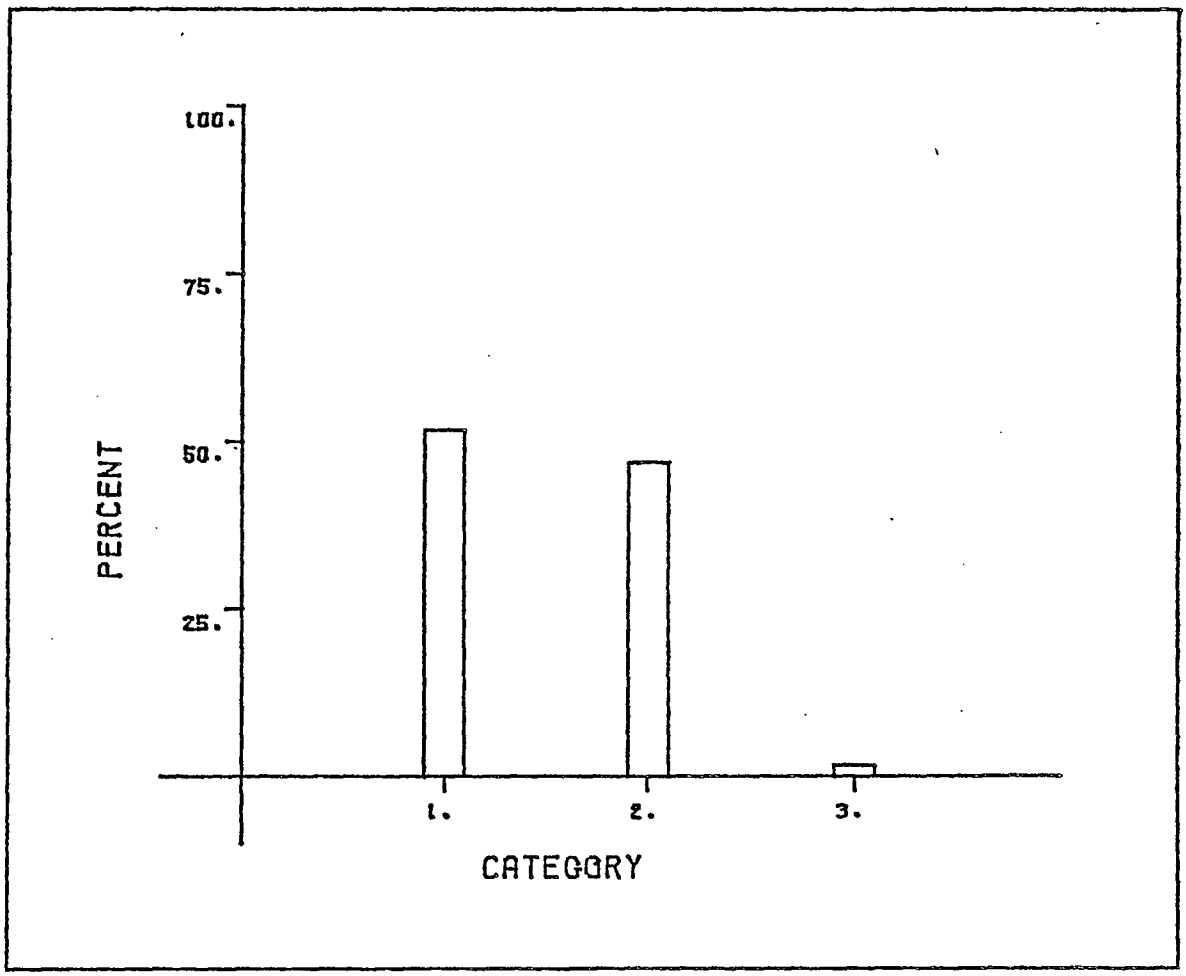
other practice, in addition to the return he receives from his business (dividends, withdrawals, a fixed salary, bonuses, and so on). First, he pays corporate and other taxes on his income from business and, second, these dollars are taxed again at the personal income tax level, together with his professional income. But when a loss is made by the firm, he is not allowed to write it off, en toto or partially, against his professional income.[10] This asymmetry was viewed by some as an inequity. The special ground on which this standpoint was substantiated derives from the fact that the owner-manager, when he set up the business, used his personal savings (out of his professional income) as the initial capital of the firm. Again, the savings out of the current professional income are often used to supplement the capital stock of the fledgling enterprise or to meet its current expenses. Thus, some commentators asserted that any losses that are made in the business should be legitimately used to reduce the pre-tax professional income. This system would establish a symmetrical treatment of business gains and losses. The whole issue appears to be unique to the small business. In a large corporation double taxation may also occur when individuals earn an income in addition to that derived from the company. Also all individuals are taxed doubly in the sense that their salaries are taxed, first, at the corporate level and, then, at the personal income tax level. But there is an important difference between the two situations, that is, the independently-managed small business and the large company. For, the manager of a big corporation, or the other individuals working in it, has not invested in it his own capital. He may, of course, be its equity shareholder but this is an entirely different matter. Also, if

Table 5.4

Tax burden

	No. of responses	%	Cumulative %
1. Excessive	31	51.7	51.7
2. Acceptable	28	46.7	98.3
3. No comment	1	1.7	100.0
TOTAL	60	100.0	

Source: Interview inputs.



a big concern incurs a loss, barring the possibility of the individual being laid off for this reason, he does not feel the impact of it directly on his salary.

Table 5.4 presents our findings on the burden of taxation on the small business.[11] Just over one-half of responses indicated that the load was excessive. The remaining comments (one abstention) were that it was acceptable. Hence, nearly a draw situation. The concept of the "excessive burden" was given various interpretations. We will discuss them presently with special reference to the exploration companies.

First, it was contended that high taxes impound unduly on current cash-flows which may be a small firm's sole or major source of finance. Some ad hoc estimates were that federal and provincial taxes and royalties, and other charges (licenses, permits, municipal taxes and compulsory contributions) may take away as much as 60 percent of the gross revenue of a "typical" small firm. This is a high proportion in view of the fact that the dominant objective of the small, and young, firm is to create adequate cash-flows to finance its prospects. At times, it takes a very high risk but the required cash-flows are slow in coming because the return on exploration gestates slowly. It would appear that, on average, about 4 to 5 years pass before the firm records its first earnings from sales, that is, if and when it finds oil and gas, develops producing wells and has markets for its inventories of gas and oil. However, oil and gas may not be found at all; also, if it is found, it may not be possible to put it on stream. There are many small firms in the industry that own producing wells but cannot sell the inventories. In such cases, even after years in business, there are no sales.[12]

If the inventories remain shut-in, this may be good for the future of the firm, if prices will rise and if it will find markets. But small firms operate mostly on a short-term basis and they urgently need cash-flows. In contrast, a big corporation, which tends to be diversified and geographically ubiquitous, will not be seriously harmed, in the sense here examined, if oil and gas is not found in one of its many ventures. Also, a large corporation would appear to have a better chance to sell its inventories. Finally, being large and old, most likely, it operates with sizeable cash-flows, anyway.

Second, some commentators were concerned with the excessive fixed royalties, taxes and fees that a small firm must pay on its "phantom income". The point was stressed that the first few years of operations are difficult because "oil and gas in the ground has no value until and when it is put on stream and sold". In the meantime, however, the firm must pay royalties and such taxes as, for example, municipal and production taxes and various fees and licenses. As there is no income yet, these charges must be paid out of the capital of the firm. Moreover, small explorers are likely to have substantial fixed costs in relation to their total cost because even at the level of the small enterprise production,processes can be highly capital-intensive. In effect, a firm which has no current revenues at all may carry heavy overheads, on which fixed payments must be made. A big corporation, by virtue of its large resources, can cope easier with fixed costs and fixed taxes and other charges which, perhaps, represent a smaller proportion of its total cost than they do in a small, especially young, firm. Furthermore, a big corporation, which has been in business for a long

time, very exceptionally only would generate nil total revenue. Assume for a moment that a minor, who carries out one single exploration prospect, or a very limited number of such prospects, fails to discover oil and gas. This means it has actually incurred expenditures but there will be no revenues. In this light, the position of the small explorer became exacerbated, in some instances disastrous, when in 1974 the Federal Government ruled that provincial royalties could not be deducted from corporate taxes.

The third variant of the interpretation of the excessiveness of taxation stressed the point that the present corporate income tax rates on small business did not adequately recognize the basic difference that exists between the "new" and "old" income from sales of gas and oil. The first revenue the firm generates from its operations is a special one. The firm had been "dropping wads of dollars down there" until it found the first productive well. The revenue from the sale of this oil and gas must be matched against all the expenses that the firm had incurred over the period prior to the first sale. In other words, this revenue carries a heavy overload of past fixed and variable outlays. Some small oil and gas businessmen believe that corporate taxes should differentiate appropriately between the new and old earnings. The starting rate of the tax should be concomitantly low or a tax holiday on new income could be allowed. When the firm begins to enjoy old income, that is, it has been selling its inventories of oil and gas for a few years, and, in the meantime, the initial exploration and development costs have been covered to some extent, then the corporate income tax rates would begin to rise gradually.[13]

The system of corporate taxation on small firms was deemed to be excessively complex.[14] In particular, retrospective changes in taxes and other charges were found to be aggravating.[15] For this reason, small businesses must seek expensive professional advice of accountants. Furthermore, the management cannot readily perceive the tax liabilities that go with different projected revenues and costs. This creates a harassing uncertainty. In contrast, a large corporation which employs its own accountants, who are always available to the management for consultation, is not confronted with this problem. Also, the cost of accounting staff to the corporation is not likely to be directly related to the degree of complexity of the corporate income tax system, at least in the short run. But in a small firm, which normally employs an accountant on a part-time basis, increased complexity means larger accounting fees. To our knowledge, few small firms employ accountants on a permanent basis.

The present volume of the official general and statistical returns required by various government agencies was criticized by the businessmen interviewed. The requests come from Statistics Canada; Alberta Conciliation Board; Anti-Inflation Board; Department of Taxation, Mines and Minerals and Labour and Environment; Alberta Securities Commission; Workers Compensation Board; Alberta Energy Resources Conservation Board, and other bodies.[16] In addition, market and financial analysts and research workers solicit information. Some are optional requests and can be ignored but most of them have to be attended to. A large corporation employs special personnel who cope with obligatory forms and the Public Relations Officer takes care of the rest. But in a small business

Table 5.5

Burden of government paperwork

	No. of responses	%	Cumulative %
1. Overburdening	55	91.7	91.7
2. Reasonable	5	8.3	100.0
TOTAL	60	100.0	

Source: Interview inputs.

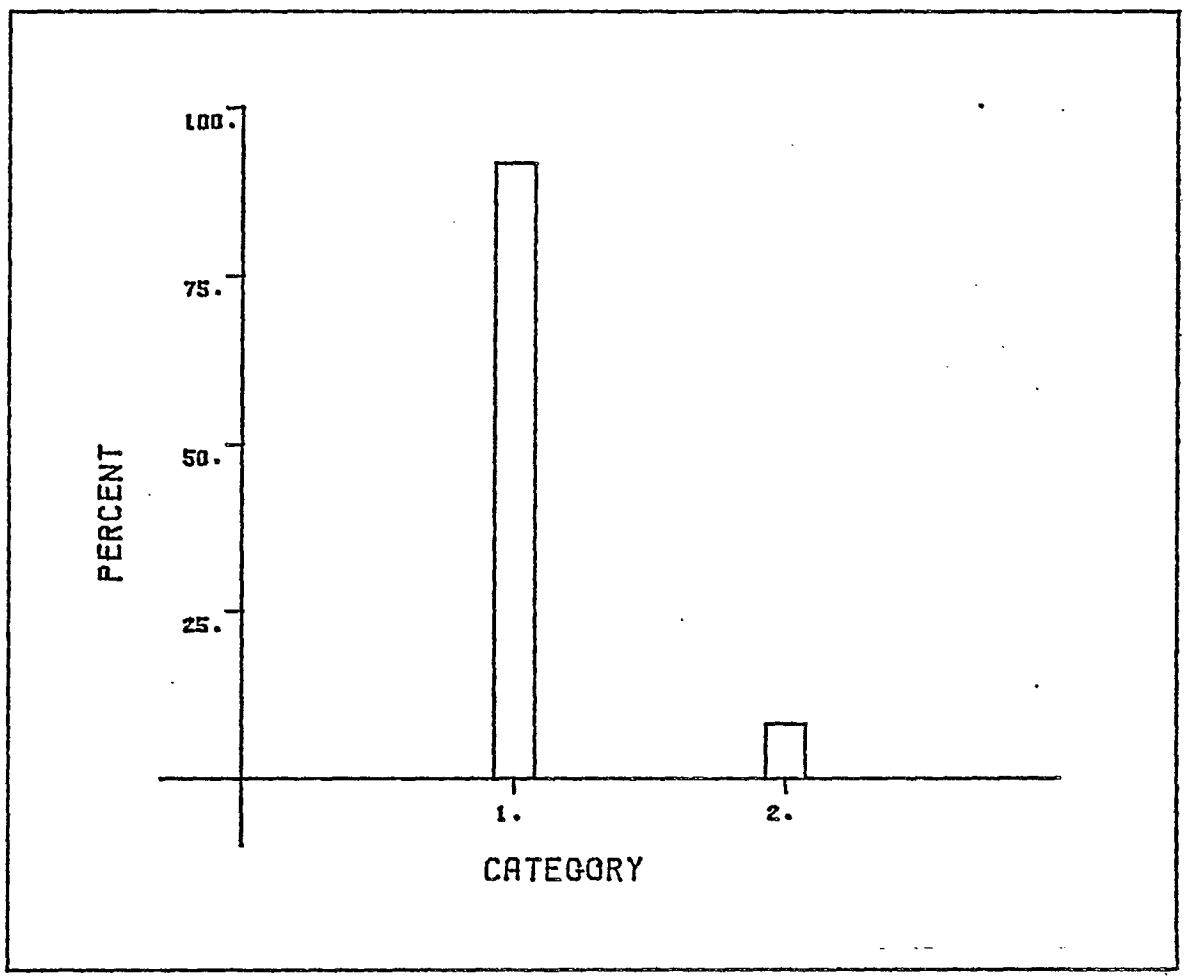


Table 5.6

Criticism of government information collection system

	No. of responses	%	Cumulative %
1. Frequent duplication	32	53.3	53.3
2. Unnecessary detail	10	16.7	70.0
3. Cost greater than benefit	5	8.3	78.3
4. Excessive number of forms	2	3.3	81.6
5. No comment	11	18.4	100.0
TOTAL	60	100.0	

Source: Interview inputs.

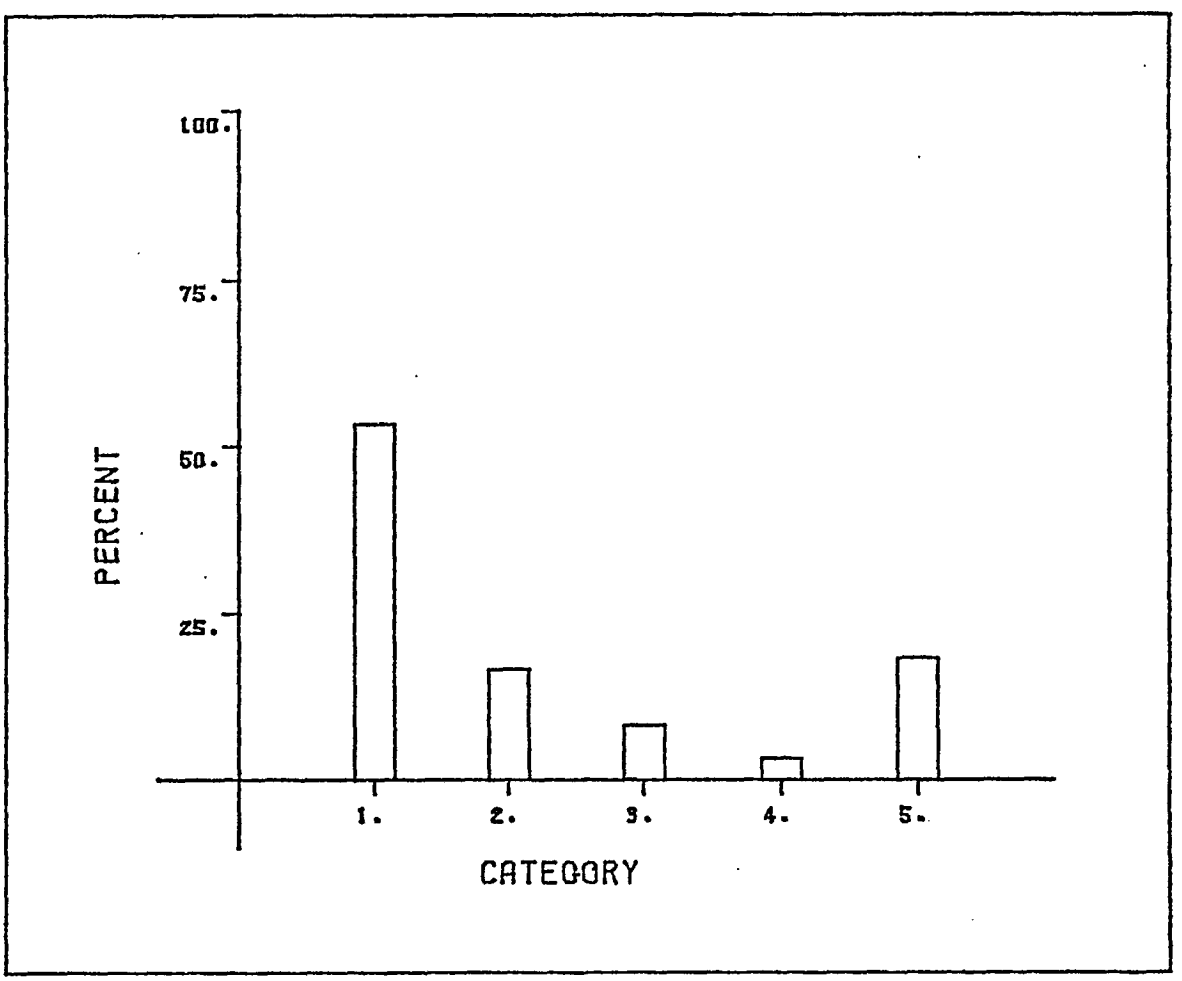


Table 5.7

Cost of form-filling

	No. of responses	%	Cumulative %
1. High	52	86.7	86.7
2. Low	7	11.7	98.3
3. No comment	1	1.7	100.0
TOTAL	60	100.0	

Source: Interview inputs.

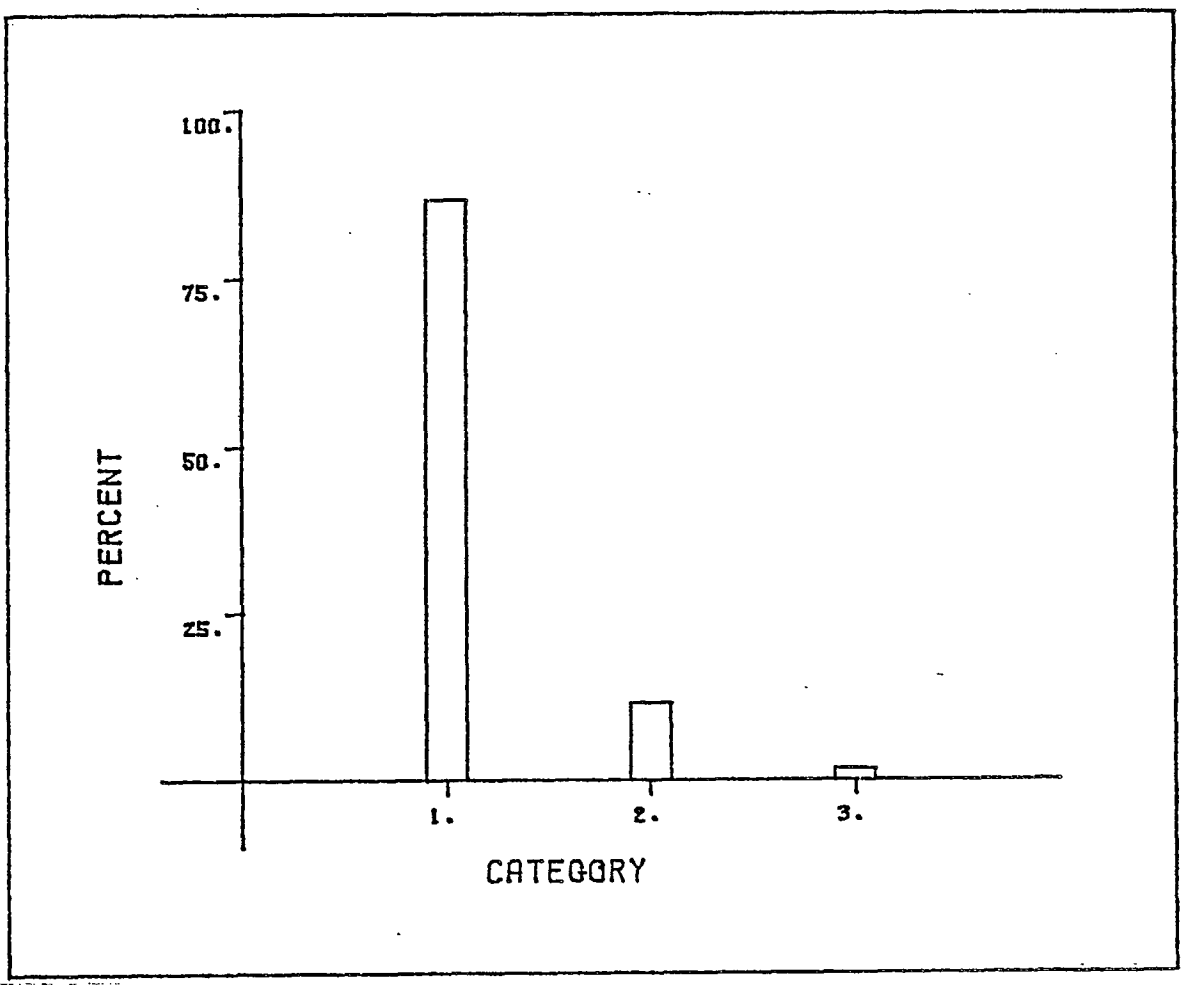
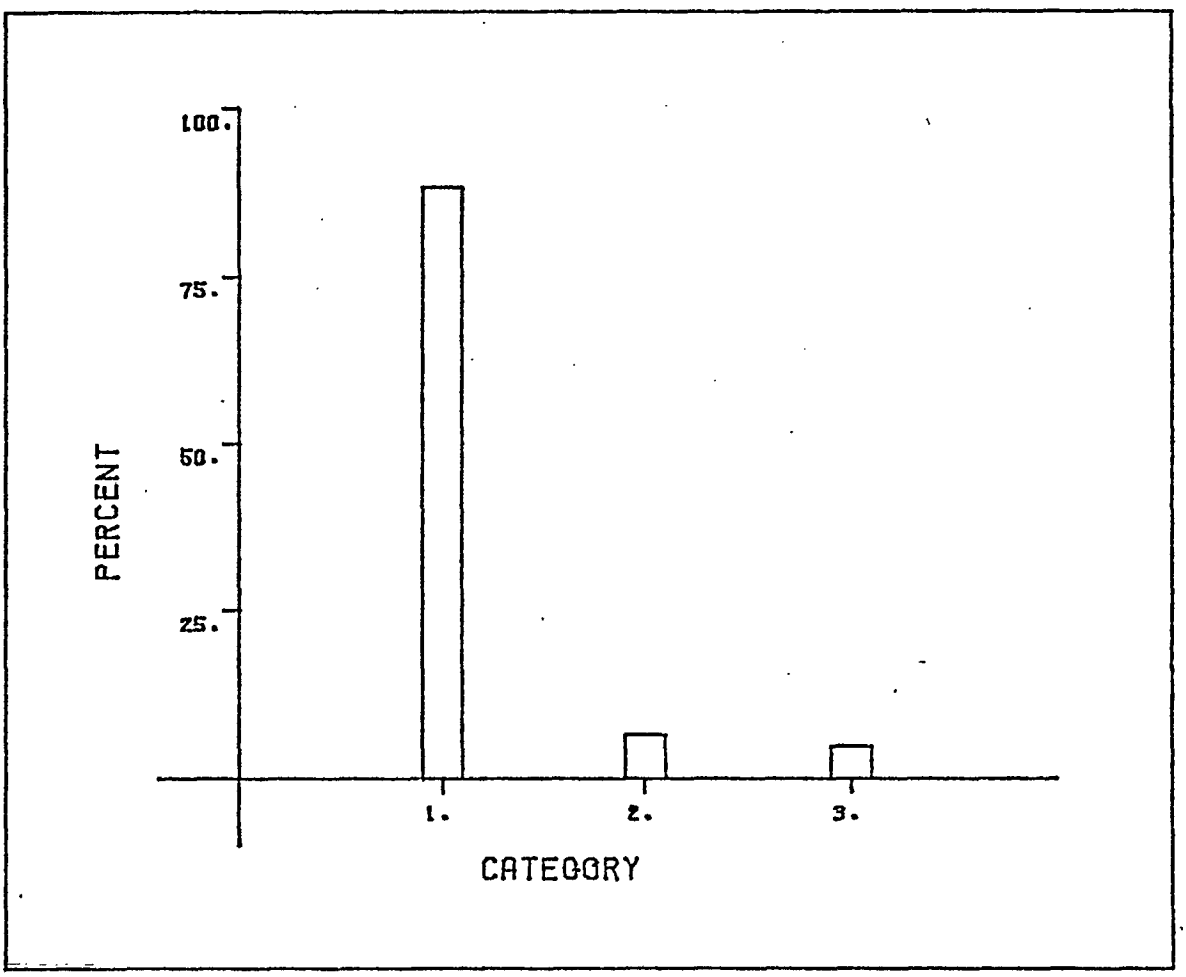


Table 5.8

Benefits from form-filling

	No. of responses	%	Cumulative %
1. Nil	53	88.3	88.3
2. Some	4	6.7	95.0
3. No comment	3	5.0	100.0
TOTAL	60	100.0	

Source: Interview inputs.



the requests are always a burden. Time has to be taken off by the manager himself or someone has to be hired to provide the required information. Hence, direct and indirect costs are involved in this "great exercise in futility".

Most business executives - 92 percent, according to Table 5.5 - stated that the volume of the official returns was overburdening. The managers are very busy attending to their business and the time that must be taken off for form-filling is an annoying and irritating interference with their work. The above notwithstanding, they believe that an "open door" policy should be observed and that they have an obligation to provide the authorities, and others, with information and data. Most managers did recognize that most of the requests were reasonable in essence and that they should be provided. What was harshly criticized is the large volume of these demands and the fact that the system of collecting information suffered from serious shortcomings.

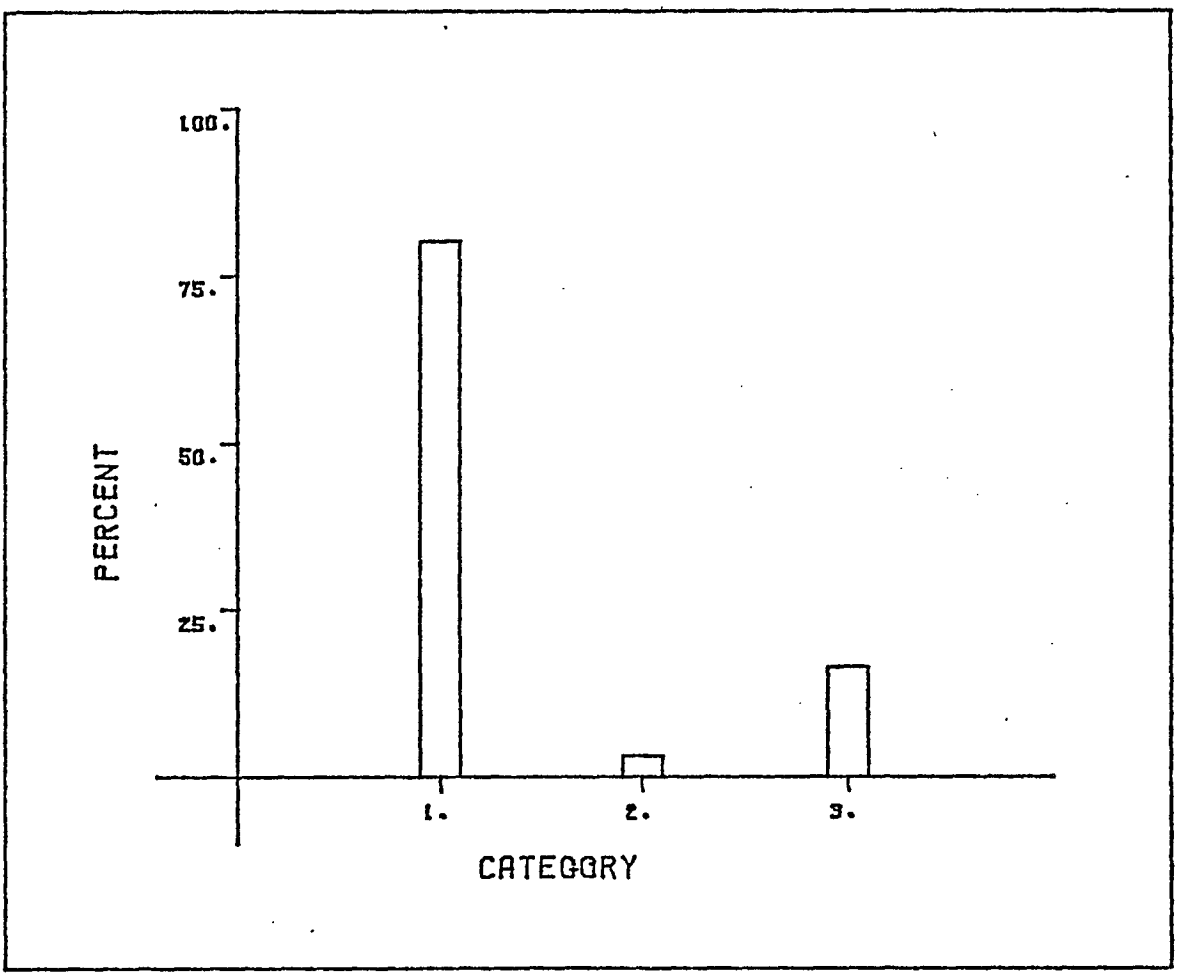
According to Table 5.6, 53 percent of the responses indicated there was a great deal of repetitive and overlapping requests in the official forms.[17] And 17 percent of the executives interviewed stressed the point that unnecessary, and time-consuming, detail was requested. Five individuals stated that the time and money cost of form-filling was invariably greater than its benefits. As Table 5.7 reveals, 87 percent of the respondents explained that the cost of answering the requests was high and 12 percent stated that it was low. Turning now to Table 5.8, we see that the benefits from the published data to the small businesses were deemed to be low. Only four individuals, or 7 percent of the total, expressed the view that the officially published data were of "some interest".

Table 5.9

Most beneficial government policies

	No. of responses	%	Cumulative %
1. Tax incentives	48	80.0	80.0
2. Reduced length of Crown land leases	2	3.3	83.3
3. No comment	10	16.7	100.0
TOTAL	60	100.0	

Source: Interview inputs.



No specific statistics on the small firm sector are published at present in Canada except for manufacturing.[18] To our knowledge, no government agency is designed to collect and publish such data in the Province of Alberta on a regular basis. But this could be done and would be of use and interest to small firms, the policy-maker and research workers.

It was pointed out to us during interviews that some published data are of importance to small firms. For example, the statistical material on drilling wells, production, land and other information, published by the Alberta Energy Resources Conservation Board, though not specifically dealing with the small firm sector, is of value.

Some businessmen were in favour of establishing one single data-collecting agency that would simplify forms and would do away with the present replication of requests. The data would be made accessible by this "central bank" (Statistics Canada could perform this task) to government agencies, the industry, and research workers. This system would be time-saving and would provide a comprehensive statistical coverage of the small firm sector on a continual basis.

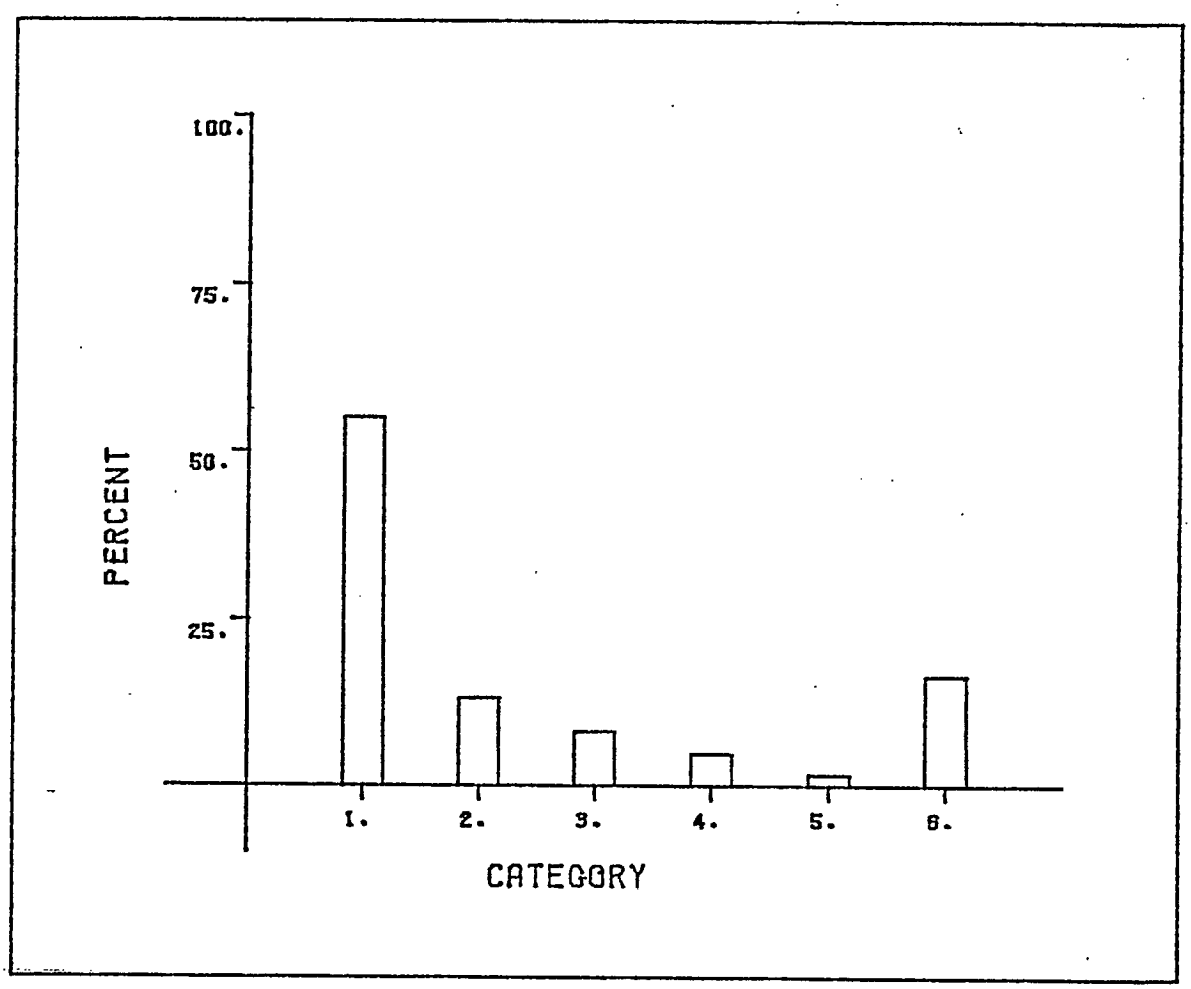
We were, of course, interested to know the view of the business-man on the most beneficial past governmental policies. As will be seen from Table 5.9, there was a strong consensus that the fiscal incentives implemented in the 1976 legislation, and those introduced since then, have been the most beneficial from the standpoint of the small enter-prise sector. Two individuals asserted that the most sizeable gain resulted from the shortening of Crown land leases to five years. This new regulation increased the periodic availability of oil and gas land

Table 5.10

Potential beneficial government policies

	No. of responses	%	Cumulative %
1. Tax incentives	33	55.0	55.0
2. Quick and reasonably termed finance	8	13.3	68.3
3. Managerial and labour advice	5	8.3	76.6
4. Accounting assistance	3	5.0	81.6
5. Technical advice	1	1.7	83.3
6. No comment	10	16.7	100.0
TOTAL	60	100.0	

Source: Interview inputs.



to the small bidder. But concerns were expressed about the rising prices of land. Some asserted that large companies get favours from the government in the purchase of oil and gas land, especially in the Foothills play. As a result, its price has been skyrocketing. And this "hits the small guy". Views were expressed that this matter could be controlled by the government so that the small explorer-developer would be able to purchase land at reasonable prices.

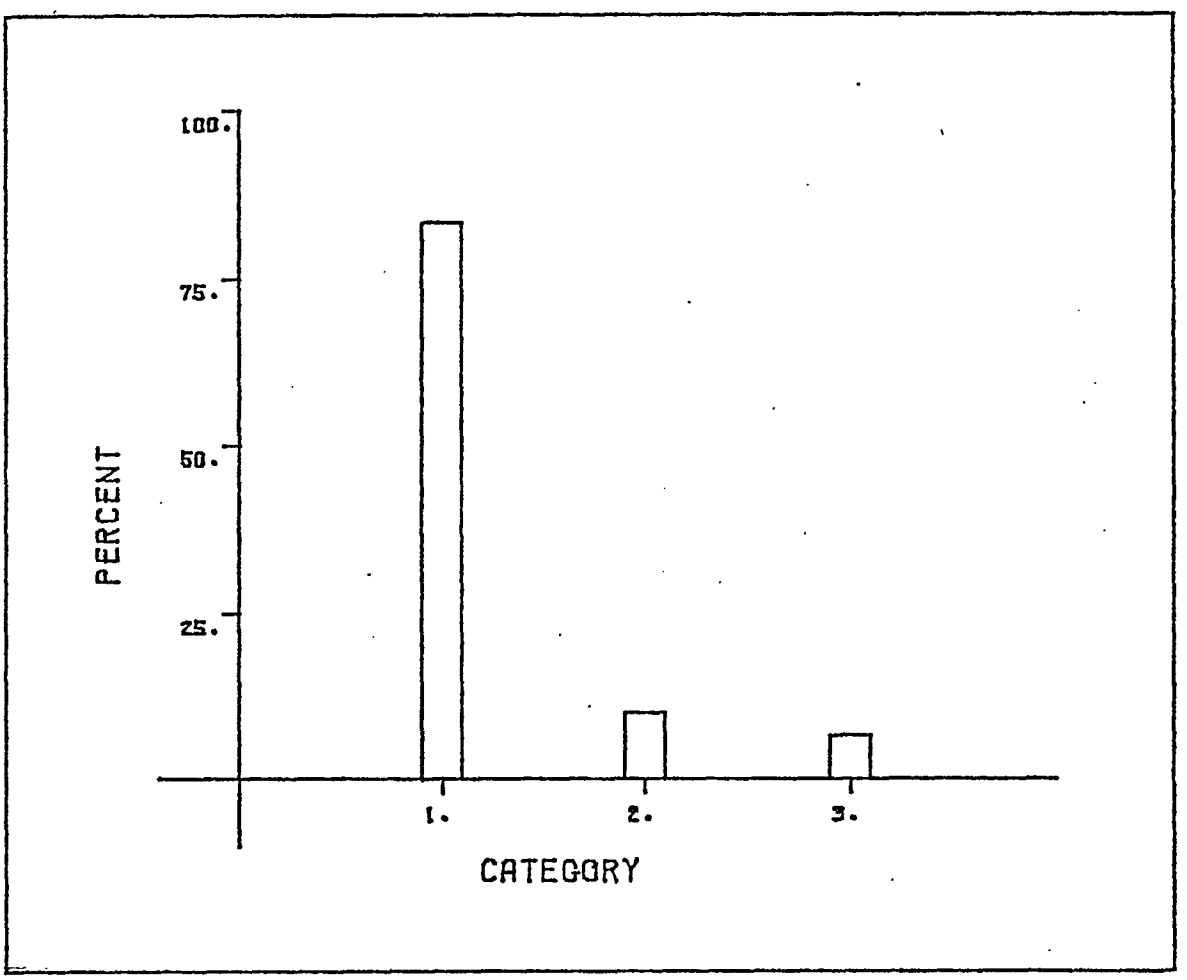
Table 5.10 sums up the reactions of the executives to the question as to what single measure, if implemented, would be the most beneficial to the small firm sector. Predictably, additional fiscal incentives were most commonly recommended. Thirty-two respondents, or 55 percent of all the individuals interviewed, expressed this view. Eight executives commented that quick and reasonably-termed government-sponsored finance would be of greatest use to small units. It was explained that the principal flaw in the present system of supply of government finance (the Federal Business Development Bank)[19] is that the processing of applications takes a long time. In extreme cases, it may be in excess of one year. In consequence, when the funds become eventually available, the venture which prompted the application may have lost some of its initially projected profitability or it may have become outright obsolete. In the oil and gas industry many aspects of the planning environment change rapidly all the time. What is needed is "quick" finance. "Slow" finance which involves procrastinated negotiations and which entails unduly detailed documentary submissions, means high direct monetary costs and the opportunity cost of time of the management. The point was also made that when a small and young firm urgently requires short term loans it is hard

Table 5.11

Need for government sponsored finance

	No. of responses	%	Cumulative %
1. None	50	83.3	83.3
2. Yes	6	10.0	93.3
3. No comment	4	6.7	100.0
TOTAL	60	100.0	

Source: Interview inputs.



for it to obtain them from the government. But when the applicant is a profitable and viable enterprise which is in position to obtain external finance from banks or via share issues, the government finance can be quickly and easily obtained.

It would appear that, in general, there is no great need in the small firm sector for government-sponsored finance. According to Table 5.11, 83 percent of the respondents stated they did not need this finance and they have never used it. Only in 10 percent of the cases investigated was there a demand for it. Some interviewees expressed the view that government finance to business may entail a waste of public funds. A firm that is viable does not need it and one that is performing poorly is not likely to make good use of it, anyway. A vibrant firm is able to generate its own finance and, if need be, can get external financing on the market. Rather than supply finance, the government should ensure a stimulating and healthy social and economic climate and avoid any actions that generate uncertainty. This would help the small firm sector more effectively. And so would , even more so, lower taxes and royalties.

Turning back to Table 5.10 we note that some executives thought there was a need for advisory government services to small firms in the areas of accounting, technologies, management and labour. However, only nine individuals identified these services as important.

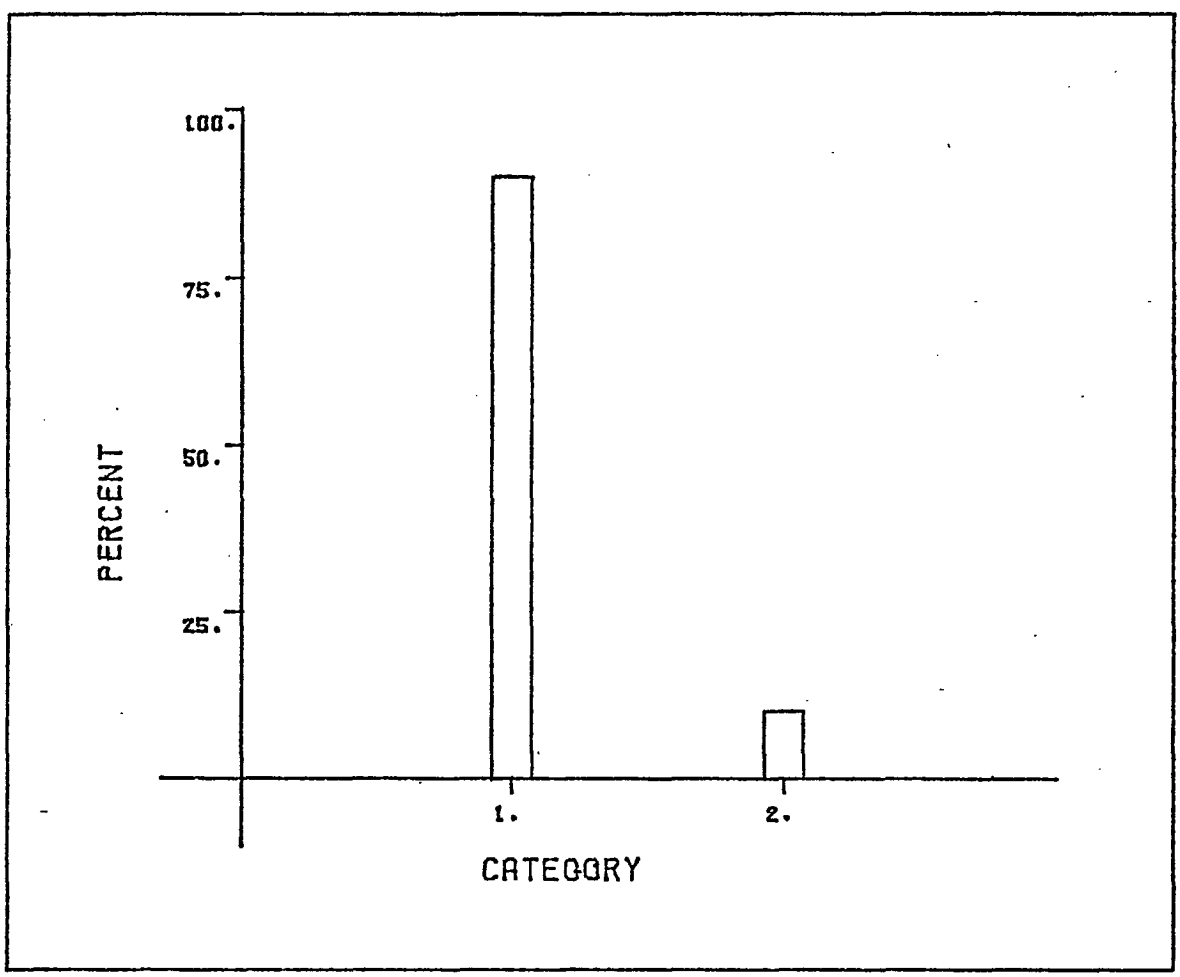
We gained an impression that there is no strong and urgent demand in the small firm sector for some of the services that are presently provided by the government because few small firms make use of these services. Some are not aware that such services are offered to the business community. Most small enterprises, when they require specific

Table 5.12

Use of government services

	No. of responses	%	Cumulative %
1. Never used	54	90.0	90.0
2. Occasional use	6	10.0	100.0
TOTAL	60	100.0	

Source: Interview inputs.



services obtain them from private firms which specialize in their supply. Table 5.12 elicits the finding that 90 percent of the respondents have never used business government services. Only six took advantage of these facilities and only occasionally.

The reaction was generally negative to our enquiry as to whether government managerial services and advice would be of assistance. First, it was asserted that government advice tends to be incompetent when a firm is confronted with special problems. And in such situations firms turn to the many private sources which command the required expertise. There is no shortage of consultants of every conceivable orientation. As we noted in Section 1 of the present Study, this group is numerically one of the largest in the industry. Second, the managers of small firms have acquired the general managerial skills and expertise by "learning-on-the-job" or "learning while doing". The point was constantly stressed that the industry is a very complicated one and that to successfully operate a small business many years of experience are necessary. It follows that government officials who do not have this experience may find it difficult, if not impossible, to offer constructive advice.[20] Evidently, the art of business management in the small firms sector cannot be learned in the classroom or from a textbook. "The classroom and the text are in the running of business itself which grows on you and you become totally immersed in it."

It would appear that there is a strong demand for small firm-oriented managerial training via universities, technical colleges and other institutes of formal education. To our knowledge, no comprehensive specialized studies of small business management are offered at present in Alberta.

All this, in spite of the fact that the small business seems to be important in the province. According to our estimates- there are 587 small businesses in the oil and gas industry alone. And those in other resource industries, wholesale and retail trade, transportation, communication, tourism, finance and other areas must run into thousands. Nonetheless, the small business has somehow been neglected by the educational institutions in Alberta and Canada; moreover, it has been studied very little.[21] In our search for the literature in this field we have not been able to locate one single study devoted entirely to the small firm in Alberta.[22]

However, to reiterate, to generate a flow of entrepreneurs-managers, the formal training must be supplemented by a period of "apprenticeship" with a major firm for a few years and, subsequently, by the actual experience of operating a small business. "You cannot teach a person to be a manager, he has to teach himself." Evidently small business management is an exacting and difficult profession. Our commentators stressed that university and other formal training in management is just the beginning. The real test comes when the knowledge acquired is applied to an actual situation and when, if errors of judgement are made, it hurts the career, ego and pocket of the businessman - but he learns. One of the most successful managers we talked to had only ten years of schooling. Apparently few small businessmen have had formal managerial training - in our sample of 60 firms, none had. Another very successful manager of a small firm had a degree in fine arts. But they all had long "on-the-job training" with the oil and gas majors and in the management of their own enterprises. Our general impression is that formal managerial training ensures more success at the level of a big corporation, than it does in

the management of a small enterprise. The reason for it is that in the former, routines and established procedures are important, whereas in the latter, individual initiative and creativity are more decisive.

As for technical advice, again, many small specialists in the industry are offering a wide spectrum of sophisticated technical services. The government is already providing technical services through the existing universities and technical colleges and other centres in Alberta. An impression was given to us that the liaison between small firms and the scientists and engineers in the universities is not strong. It was believed that many technical problems could be solved in the universities. But only in a few isolated instances did small firms approach a university with technical problems.

Next, we delved into the issue of the industrial training of labour that is being provided in Alberta by governmental agencies and institutions. High marks were given to the Southern and Northern Alberta Institutes of Technology. Evidently these technical institutes have done an excellent job in training specialized labour for the industry. And so did the Arctic Exploration School in Edmonton.

The final facet of government activities that we enquired into was the government-initiated promotion of invention and innovation in the small firm sector. It is in this area that assistance is needed and would result in long-term benefits to the industry. Small firms have inadequate resources to maintain regular expenditures on R&D. In the November 1978 Budget, a special 25 percent tax credit was allowed on R&D expenditures by small businesses. As we noted in the previous Section, many small enterprises do not incur any regular R&D outlays. To stimulate R&D

activities in these enterprises direct grants and subsidies would appear to be the most appropriate.

After having probed into the important issue of government policies, we were, of course, interested to know what the small firm sector believed the role of government ought to be. The reactions clearly distinguished between "governing" and "interfering". Under the caption of "governing" the following functions were stressed: Maintenance of an appropriate tax incentive system, regulations of the use and allocation of oil and gas lands, protection and maintenance of good quality of the natural environment, legislation to ensure the safety of the work-place and well-sites, legislation of labour-management relations and subcontracting, provision of information on the industry, and so on. These measures were recognized as necessary for a proper management of the industry and the government alone can initiate and implement them in consultation with business and labour.

"Interference" was resented and deemed undesirable. According to the reactions received, interfering actions by the government include regulations and fiscal and other policies which create impediments to the efficiency and viability of the private enterprise sector. As one commentator put it: "The system of private enterprise in this industry was squashed during the 1973-76 period."

We wondered why things have gone astray and why policies were pursued which resulted in suppression of the rich supply of private enterprise in the industry. A lot of blame was put by the businessman on the apparent lack of understanding by the government of the modus operandi of the industry, which is complicated, highly technological and

characterized by many unique features. Evidently, it takes a long time to learn what the industry is about and the decision-maker responsible for the policies "has not done his homework". Besides, and insofar as the small firm sector is concerned, there has also been, until recently, a great deal of indifference on the part of the government.

The small business world was puzzled by government policies. At the time when it was recognized in Canada that there will be a shortage of oil and gas, policies were implemented which discouraged exploration and, moreover, triggered off a mass exodus of capital to the United States. Also, the business world found it difficult to comprehend the widespread condemnation of profits in Canada at the time of the stringent measures of 1973 and 1974 which supposedly were designed to capture pure rents. Evidently, confusion arose as to what were windfall gains and what were the normal returns that firms could expect to get from their operations.[23] This philosophy would appear to have been shared in those years of the doomsday in the industry both by the public at large and the government policy-maker.[24] It took almost four years for the government to reinstitute the private business sector in the industry to its proper function. Much has been done in the right direction but, according to the small businessmen, much more is desired.

Notes to Section 5

1. Government policies have been responsible for the ups and downs in the industry which, for this reason, does not follow the cycle of business of the national economy. At the time of writing, the Canadian economy was depressed with a level of unemployment of over 8 percent. However, the Alberta petroleum industry was experiencing a boom. This high level of activity was largely the result of a succession of budgets which provided drilling and other incentives to the industry and of rising wellhead prices of oil and gas. For an analysis of government policies, see, J.A. Armstrong and Eric Kierans, "Tax and Royalty Treatment of the Extractive Industries: Impact and Implications," Keith O. Fowler, "The Oil Industry and the May 6, 1974 Federal Budget," E.P. Aboussafy, "Tax and Royalty Legislation in Alberta," 1974 Conference Report, Canadian Tax Foundation, 1975, and S.E. Evens, "Tax and Royalty Treatment of the Petroleum Industry - 1974-75," R.W. Cochrane, "Provincial Tax and Royalty Development: Oil and Gas Resource Operations," T.S. Tuschak, "A Federal Perspective on the Tax Treatment of the Petroleum Industry," C.D. Quirin and B.A. Kalymon, "Changing Incentive Structures in Petroleum Exploration," in 1975 Conference Report, Canadian Tax Foundation, 1976.

2. See, in particular, The Small Business Policy, Minister of State Small Business, May 30, 1978; Small Business in Canada: Perspectives, Minister of State Small Business, September, 1977; Improving the Equity Financing Environment for Small Business in Canada, Minister of State Small Business, May 24, 1978; Enterprise Development Programme, Department of Industry, Trade and Commerce, 1977 (Cat. No. Id 31-54/1977); "Ten Point Plan for Small Business," Minister of State Small Business, September, 1977; and Address by the Honourable Len Marchand to the 48th Meeting of the Canadian Chamber of Commerce, Edmonton, September 19, 1977.

3. Joseph A. Schumpeter, The Theory of Economic Development, Oxford University Press, 1961.

4. It would appear that this situation is not unique to Canada. For example, the Bolton Report (Ch. 9.2) stated that "it emerged very clearly from the written evidence we received that many small firms believed themselves to be operating in a generally hostile environment as a result of the actions of the Government." and ". . . an alarming number" of small firms were "hurt and bewildered, doing their best to function properly in what they felt to be an unfairly hostile environment."

5. C.D. Quirin and B.A. Kalymon, "Changing Incentives Structures in Petroleum Industry," loc. cit.

6. Hans Maciej, President, the Canadian Petroleum Association, stated the following concerning the decision of the Honourable Jean Chretien,

to put off the previously agreed January 1, 1979 one dollar per barrel increase in the domestic price of oil and to deregulate gas price: "The uncertainty created could not have come at a more critical time. Producers, particularly small ones, now have no idea how much revenue will be available for exploration and capital expenditures." And Mr. Don Getty, Alberta's Energy Minister, commented that: "This can affect the Alberta economy and, in the long range, the rest of Canada. We have enthusiastic exploration, and if you turn that off with short-term moves, capital will go other places," Saint John's Calgary Report, September 4, 1978. See, also, Climate for Entrepreneurs - A Comparative Study, I.A. Litvuk and C.J. Maule, Carleton University, 1974 (Technological Innovation Studies Program; Trade, Industry and Commerce) and "Survey Indicates investment hampered by uncertainty of government," Business Quarterly, University of Western Ontario, Winter 1976; "Cashing in on new entrepreneurial climate," ibid., Spring 1976; and "Ottawa program generates business 'optimism'," Montreal Star, September 20, 1977.

7. Another comment from our interviews was: "You never know what they will do. If you examine the posture of the federal government, they veered one hundred and eighty degrees in the last few years. This creates uncertainty. One thing that surprises me is that it took a long time for the chicken to come home to roost. We do not know what they are going to do next. You cannot even foretell their vacillations - you do not know what you are trying to assess."

8. "I learned that when it comes to government do not bet on anything. They are slow to react. We run scared of government's uncertainty. Down in the US there is no uncertainty. Their energy problems are chronic and exploration risk greater - I would take that rather than the government risk - something over which we have no control. There I take geological risk, I can get gas and will go to the market. For the time being I would rather be in the US. See what five years of foregone cash-flow will do to you here."

9. The following studies analyse this issue for the industry as a whole: Walter J. Meade, "Private Enterprise, Regulation and Government Enterprise in the Energy Sector," in Oil in the Seventies (various contributors), The Frazer Institute, 1977; J.G. Debanné, "Oil and Canadian Policy" and R.E. Hamilton, "Natural Gas and Canadian Policy," in The Energy Question: An International Failure of Policy, eds. E.W. Erickson and L. Waverman, The University of Toronto Press, 1974; Natural Resource Revenues: A Test of Federalism, ed. Anthony Scott, British Columbia Institute for Economic Policy Analysis Series, University of British Columbia Press, 1975; and R.J. Lemay, "Taxation of the Petroleum Industry," 1972 Conference Report, Canadian Taxation Foundation, 1973.

10. This situation has changed somewhat. The June 1978 Budget amended the Income Tax Act and provided broad deduction for capital losses. Allowable capital losses on shares or debts of Canadian-controlled private corporations will be deductible for tax purposes against income from any source. The change applies to losses incurred after 1977. If the loss exceeds income in the year it occurs, the balance may be carried back against income of the previous year or forward against income of the next five years. The rules apply to both corporations and individuals.

11. For the most salient features of the system of taxation of small business in the oil and gas industry see, Royal Commission on Corporate Concentration, Study No. 28 (Corporation Concentration and Canadian Tax System).

12. While the gas is shut-in, the small company must pay interest on its loans and it also incurs many other expenses. Thus bills have to be paid but there are no cash-flows.

    We quote an interview comment which illustrates the desperate position in which small firms are: "Does the government understand the problem the small guy has? Some people in the business do not understand what is going on. I ask myself: Why bother to drill a well? The thing will be shut-in for five years. This is happening all the time. How can the government become aware of the problem? You are a small guy and you do not have cash-flows for operation and you have not yet seen a return on your investments."

13. It would also appear that the sudden rise in the corporation income tax rate from 26 percent to 46 percent, when the firm begins to earn more than $150,000 revenue per annum, is unjustifiably abrupt and causes hardship to small businesses.

14. Complexity of the income tax system was dealt with by the Royal Commission on Corporate Concentration, Final Report, pp. 278 ff. See, also, "Small business tax law needs clarification," Globe & Mail Report on Business, July 8, 1976 and "Active business income - there seems to be some confusion!" Canadian Business Magazine, July, 1975, p. 58.

15. An example of another irritant to the small businessman is as follows: "Workers Compensation has to be paid in advance. How do I know how many people will I employ? This year I used last year's payroll and I underestimated my employment because my employment doubled from the last year. But I had to pay a penalty for under-estimation. I gave employment to a lot of people who would be roaming the streets today and living on welfare, and I would expect I would get a good pat on the back but, instead, I got a kick in my pants. This is really something - and it is really demoralizing."

    Again, sales taxes must be remitted regardless of whether the cash for the sale has been collected or not. There are cash penalties for the failure of forwarding sales taxes collected on time. Payments

are demanded by the government on specific dates and may adversely affect the cash-flow of the small firm.

16. In June, 1978, The Paperburden Office (controller, James Howe) was set up with a mandate to start a programme which would control the number and type of forms which are sent to businesses by various federal government agencies. The issue of the burden of paperwork has recently received a great deal of attention. See, V.R. Berlinguette, "Small Business Statistics versus Paper Burden," Canadian Statistical Review, April, 1978; Royal Commission on Corporate Concentration, Final Report, pp. 329 ff.; "Inquisitive bureaucrats ponder super-form to collect financial data," Financial Post, December 13, 1975; "Ottawa to cut paperwork of small business," Financial Times of Canada, October 3, 1977; "Abbott plans to cut business paperwork," Montreal Star, September 19, 1977; and "Marchand lifts paper load," Canadian Controls & Instrumentation, June, 1977.

17. A comment made by a business executive: "Government departments will not accept each other's information. You have to serve them individually, hence, a lot of paper work. To me this is perplexing. I simply have no time to do all this work."

18. Annual Census of Manufacturers, Statistics Canada, Cat. No. 31-210-P and Type of Organization and Size of Establishments, ibid., Cat. No. 31-210.

19. The Bank makes loans, provides management counselling services (CASE - Counselling Assistance to Small Enterprises) to assist small businesses in improving their methods of doing business and it also runs management training seminars.

    See, "FBD loans millions to small business," Journal of Commerce, September 5, 1977.

    Alberta Opportunity Company provides financial assistance to small businesses for the purchase of raw materials, inventories, machinery, equipment, and buildings.

20. Some advisory government agencies are staffed with experienced people, for example, the Counselling Assistance to Small Enterprises, which is administered by the Department of Industry, Trade & Commerce, employs several retired executive business executives selected for their management experience.

21. Bill S-972 of February 21, 1977 in the United States authorized the Small Business Administration to make grants in support of the development and operation of the Small Business Development Centres to be located in selected universities across the U.S.A. At present, there are four such centres in the United States: Oregon University, Utah University, Carnegie (Pittsburgh) and M.I.T.. The role of the Small Business Institute program in the business curriculum in 380 colleges and schools of business in the United States is discussed by

W.D. Stahlecker and A.D. Pabst in "The Small Business Institute Program," in Collegiate News and Views, Volume XXX, No. 2, Winter, 1977-78. In Europe small business is studied in The Durham University Business School in England; the Jutland and Copenhagen Institutes of Technology in Denmark; The Institute für Gewerbeforschung in Vienna, Austria and in Sweden, the University of Umea.

In Canada the York University Small Business Assistance Programme has established a whole network of formal and informal advisors, ranging from private financial consultants, bankers, civil servants to small businessmen who have first-hand practical experience in the industry.

22. In Canada the first study of the small business was made by Rein Peterson, op. cit.. See, also, Canadian Entrepreneurship - a Study of Small Newly Established Firms, by I.A. Litvak and C.J. Maule, Carleton University, 1971 (Technological Innovation Studies Program; Industry, Trade and Commerce).

23. R.M. Hyndman and M.W. Bucovetsky, "Rents, Rentiers and Royalties: Government Revenue from Canadian Oil and Gas," in The Energy Question: An International Failure of Policy, eds. E.W. Erickson and L. Waverman, The University of Toronto Press, 1974.

24. See, "Public misunderstanding about corporate profits is widespread," Financial Post, November 22, 1975; "The 'dirty' word profit defended," Vancouver Sun, January 22, 1977; "What has made profit dirty word?" Globe & Mail Report on Business, November 13, 1976; "Profit claimed as necessary for companies as food for people," Globe & Mail Report on Business, May 12, 1976; "Profit is essential, businessmen insist," Montreal Star, January 24, 1977; and "Survey finds public believes profits are excessive," The Globe and Mail, Toronto, May 27, 1976.

SECTION 6

AN ASSOCIATION ANALYSIS OF INTERVIEW INPUTS AND THE ASSET SIZE OF SMALL FIRMS

We used the crosstabulation technique of the SPSS computer program[1] to study the association between the size of the 60 small firms, whose chief executives were interviewed, and several variables. The information on these variables was obtained during the interviews.

Size of the businesses is measured by the value of their assets in 1976/77. This measure, by comparison with the employment measure which we used in Section 1 of the present Study, more adequately reflects the changes in the resources, technologies and organization used by the firms. It goes without saying that this indicator has its own shortcomings. There is no perfect measure of size of firms, be it employment, assets, expenditures, profits, or any other criterion.

We obtained the required data on the value of assets from the available published Annual Financial Statements, from the accounting forms that we forwarded to many firms and through direct enquiries.

The value of assets per firm varies from $26,000 to just over $10 million. By comparison with large corporations in the industry, our firms are small by asset-value. The above notwithstanding, the sample comprises very tiny units and some "giants". The biggest unit had assets many times larger than those of the smallest enterprise. Clearly, the firms in our sample varied considerably more by assets than they did by employment, to reiterate, the employment per firm ranged from one to ten persons.

Before we interpret the results obtained, it may be useful to discuss in some detail a few pertinent aspects of the technique of association that has been employed here. The following comments can be omitted by those who are familiar with this method of statistical analysis.

The relationship between the asset-size of firms and each of the variables studied is depicted in a crosstabulation table and summarized with various measures of association and significance tests. The tables are large and, for this reason, cannot be reproduced here. However, some aspects of these tables will be briefly discussed when deemed relevant.

A measure of association indicates how strongly the variables considered are related to each other in the cases actually studied. For example, if we related the asset-size of our firms to the level of educational achievement of their chief executives, a measure of association would indicate to what extent these two characteristics occur together in our sample of 60 businesses. If we studied all the population of small firms in the industry, the measure would sufficiently summarize the relationship between the two variables. However, we examined only a small proportion (some 10 percent) of the total universe. Moreover, we are not interested in the sampled cases per se, rather, we hope to infer that a relationship found in the sample actually exists in the total population of small firms. The answer to this problem is provided by the tests of statistical significance.

With a significance test we learn the probability that the relationship observed in our sample could have happened by chance. The tests

are based on the results of a hypothetical experiment or the "null-hypothesis". We thus suppose that assets and education are totally unrelated to each other in the universe of small firms, but are each distributed exactly as they are in the observed sample. Next, we suppose that an infinite number of samples of the same size are drawn from the total population of small firms in the industry. The probability of the observed relationship occurring by chance is equal to the proportion of the samples in which the relationship between assets and education is as strong or stronger than in the observed sample of 60 small units. It has become convention in social sciences to accept as statistically significant those relationships which have a probability of occurring by chance 5 percent of the time or less, i.e., in 5 out of 100 samples. This significance level is strictly observed in some type of data and by pure statisticians. Accordingly, if a significance test shows a probability higher than 5 percent, it is concluded that there exists no relationship at all, and if this probability is 5 percent, or lower, the conclusion is that there exists a relationship. However, departures from this approach may be legitimately made at times depending on the nature of the variables investigated and a host of other considerations. The analyst may thus set the significance level above the 5 percent probability.

After a careful consideration of our statistical inputs, we came to the conclusion that in our interpretation the 6 percent level of significance will legitimately indicate the existence of an association. For the sake of consistency, we will observe this upper significance level throughout without any exceptions.

The computer print-outs of the crosstabulation tables are accompanied by 14 different measures of association and several significance tests. The decision as to which measures of association are appropriate for particular pairs of variables (assets and a variable), and the interpretation of their significance, must be made with due care because various factors are at play. First, the size of the sample is relevant since in large samples even weak relationships may prove to be statistically significant. Second, the format of the table is pertinent; in consequence, some tests apply to square tables while others apply to rectangular tables. Third, different tests apply to different levels of measurement of the variables studied.

The basic topology of the traditional classification of the levels of measurement of variables encompasses nominals, ordinals, intervals and ratios. The nominal level, common to our inputs, and the lowest in the topology, makes no assumption whatever about the values being assigned to the data. We will, for instance, associate the asset-size of firms with a variable which represents their industrial activities. Each type of activity is a distinct category and it merely serves as its label or name. No assumption of ordering of, or distances between, categories is made because there exist no a priori grounds (at least, in this study) on which one could assert that service and supply, for example, is superior or inferior to consulting or data processing insofar as size of firms is concerned. We could as well associate the colour of eyes of the chief executives with the size of their businesses. To put it differently, there is no inherent ordering among categories of such variables. And when numeric values are attached to nominal categories,

numbers are used merely as symbols that are easily read by the computer. The properties of the real number system (adding, multiplying, etc.) cannot be transferred to these numerically coded categories.

Ordinal level measurement means that it is possible to rank all the categories of a variable according to some criterion. Each category, for instance, a given level of the educational achievement of chief executives, has a unique position relative to the other categories, that is, it may be lower in value than some categories, and higher than others. However, we do not know how much lower or higher it is. In other words, we do not know the distances between categories. The nature of the two highest order measurements, viz., interval and ratio, is self-explanatory. They are ordinal variables with known category intervals.

Some general rules are applicable to the choice of the appropriate measure of association and its significance test. When the two variables are measured at the nominal level, chi-square, Cramer's V, the contingency coefficient, lambda and the uncertainty coefficient are the appropriate statistics. These statistics can also be applied when the variables are measured at a higher level (ordinal, interval or ratio) but the measures of association are then calculated as if the variables were nominal. In consequence, any information regarding the order of, or distances between, categories is ignored. When both variables are measured at, at least, an ordinal level, Kendall's tau B and C, gamma, or Sommers' D are the required tests. These statistics have no meaning and should not be used when one or both of the variables are measured at the nominal level. Finally, Eta applies when one of the

two variables is nominal and is assumed to be the independent variable, while the other is ordinal and is assumed to be the dependent variable. With the exception of those measures which are based on chi-square (Cramer's V and the contingency coefficients) all the other data are probability or proportional reduction in error statistics because they record the probability of predicting the value of one variable if we know the value of the variable with which it is associated. Lambda, the uncertainty coefficient and Sommers' D provide information on the symmetric and assymetric interdependencies between the two variables investigated by assuming alternatively that one of them is the dependent variable. We also obtain information on whether the variables studied are positively or negatively associated.

We now turn to the task of interpreting the results obtained. The reader, if he disagrees with our interpretation, will be able to provide his own because all the relevant measures of association and statistical tests are shown in Table 6.1. To start with we will provide as much detail as possible but later, to avoid repetition, only new situations will be dealt with.

We will associate several variables with the asset-size of firms but not with all the variables on which we had information. Selectiveness was dictated for several reasons. Some variables were excluded because they could not be viewed as a factor influencing size of firms. For example, the opinions that the chief executive of small enterprises had regarding the causes of failure of small firms in the industry is not a factor that could be logically expected to be related in any way to the size of businesses that the individuals controlled. In addition,

Table 6.1

SPSS crosstabulation analysis of association between value of assets per firm (A) and interview inputs (B)

	(1) Employment	(2) Age of firm	(3) Type of activity	(4) Form of organi-zation	(5) Founder/ nonfounder	(6) Formal education	(7) Type of education
1. Raw Chi Square	76.781	79.926	53.669	17.754	3.896	40.104	54.911
Degrees of Freedom	72	72	64	8	8	48	48
Significance	.332	.246	.818	.023	.866	.784	.229
2. Cramer's V	.399	.408	.334	.543	.254	.334	.390
3. Contingency Coefficient	.749	.755	.687	.477	.246	.633	.691
4. Lambda (Asymmetric)							
With A dependent	.235	.235	.176	.058	.039	.098	.137
With B dependent	.180	.208	.000	.200	.000	.000	.032
5. Lambda (Symmetric)	.207	.222	.113	.090	.032	.082	.097
6. Uncertainty Coefficient (Asymmetric)							
With A dependent	.309	.328	.197	.078	.017	.115	.156
With B dependent	.309	.325	.274	.297	.076	.344	.243
7. Uncertainty Coefficient (Symmetric)	.309	.327	.229	.123	.029	.173	.190
8. Kendall's tau B	* .154	* .159	- .101	.318	.091	- .199	.173
Significance	.056	.051	.161	.002	.210	.034	.049
9. Kendall's tau C	.152	.156	- .088	* .365	* .096	*- .119	.154
Significance	.056	.051	.161	.002	.210	.034	.049
10. Gamma	* .174	* .178	- .130	.534	* .171	*- .384	.222
11. Somers' D (Asymmetric)	*	*		*	*	*	
With A dependent	.155	.159	- .116	.487	.151	- .342	.198
With B dependent	.154	.158	- .089	.208	.055	- .116	.151
12. Somers' D (Symmetric)	* .154	* .159	- .100	* .291	* .081	*- .173	.171
13. Eta							
With A dependent	.439	.424	* .514	.387	.108	.401	* .445
With B dependent	.444	.428	.224	.543	.254	.291	.260
14. E^2 (with A dependent)			* .264				* .198
E^2 (with B dependent)							
See Table	3.1	3.7	3.3			3.11	3.12

* denotes the association measures, and their significance tests, used in our interpretation.

the information on some variables was too general, scanty and fragmentalized, inconsistent and ambiguous to be used in the present analysis.

No association was found between the following variables and the asset-size of firms: the structure of markets, the degree of competition, the level of decision-making, the nationality and age of chief executives, the quality of labour-management relations, the ease or difficulty of securing external finance, the structure of the initial and current sources of finance, and many responses to various questions dealing with government policies. In what follows, a few cases of special interest will be discussed, although no association was found between the asset-size and a variable.

1. Size of firms and employment per firm

The two ordinal variables that were associated are the two measures of size of firms that have been used in this study. Kendall's tau B, which applies to square tables (this condition is nearly satisfied since the corresponding crosstabulation table is 9 x 10), is significant at 5.6 percent (i.e., it is below the maximum critical probability level of 6 percent which we decided to use in our interpretation). The corresponding Kendall's coefficient is positive and Sommers' Ds - asymmetric and symmetric - are almost identical. The values of the above statistics and that of gamma tell us that the relationship between assets and employment is fairly weak and positive.

Our findings indicate that, first, size of firms is associated with their employment in the universe of small firms in the industry. Second, larger firms have larger employment, and vice versa. Third,

our knowledge of employment per firm helps us better predict the asset-size of firms, in the absence of any other information, by some 15 percent. And if we know the asset-size of firms we can predict their employment with the same improved success. This finding suggests that, at the level of the small firm, the two alternative measures of the size of firm - assets and employment - are closely comparable in the sense that the knowledge of one helps us better explain the other to the same extent. This does not, of course, mean that they are equally good measures of size of firms.

An inspection of the relevant crosstabulation tables reveals that firms with the employment of one person (there were seven such small units) and two persons (ten) operated eight sizes of firms. Hence, these tiny businesses (by employment size) displayed a remarkable asset variability. On this count, assets per firm would appear to be a better measure of size of firms than employment per firm solely in the sense that the former measure permits a greater differentiation of firms by size.

2. Size of firms and age of firms

There exists a positive association between these two ordinal variables. The finding that older firms have large assets is not surprising. Businesses usually start with small assets and, with the passage of time, they tend to accumulate a larger stock of productive means. There were a few outliers in this respect (as the corresponding crosstabulation table shows). On the one hand, a few old firms had very small assets. A possible partial explanation of this situation may

be a desire of the managers to keep these enterprises small for the sake of profitability, via a complete control of their operations. On the other hand, a few very young firms had inordinately large assets.

The statistics tell us that, if we know age of firms, we can better explain their size by 16 percent, and that we can improve our explanation of their age, if we know their asset-size, by the same percentage.

3. Size of firms and type of activity

The nine activities in which the firms were engaged represent a nominal variable because there exists no rationale on the basis of which these activities could be set out in an ordinal way. Since assets are a nonequidistant interval variable and the dependent variable, and activities are a nominal variable and the independent variable, Eta is an appropriate measure of association. Eta squared (its value varies from 0 to 1.0) is often referred to as the correlation ratio. It has an intuitive interpretation as the proportion of variance in the dependent variable accounted for by the independent variable. In our case the correlation ratio is 26 percent. This would appear to be a reasonably "significant" value of this ratio and we may conclude there is a relationship between assets and types of activity.

Judging by the value of the corresponding Eta assymetric (there is no symmetric Eta) we can also say that, given the categories of activities investigated, the "regression coefficient" of assets on activities is .51 (this value depends on how dissimilar the means on the dependent variable are within the categories of the independent variable.

When the means are identical, Eta is zero and when they are very different, accordingly, Eta nears 1.0). However, beyond saying that there exists an association between the two variables we cannot say anything in addition because we are dealing with a nominal variable which is not susceptible to ordinating and thus we do not know the distances between categories of this variable.

The crosstabulation table shows that oil and gas explorers were of all sizes, with some tendency towards concentration within the assets class-interval from half-a-million dollars to two million dollars. Another group which recorded a similar pattern were well-service businesses. This group, however, comprised comparatively larger units. Consultants operated with small assets and the remaining groups by activity were widely "scattered" with regard to the value of their assets, although, on the whole, their assets were relatively small.

4. Size of firms and their organization: private and public corporations

Although the organization characteristic is a nominal variable, because it consists of only two categories, it is a dichotomy. While some dichotomies are based on a natural ordering (making a loss or a profit), this dichotomy has no inherent basis on which either category could be judged, for instance, as superior, preferable or higher. Yet, any dichotomy can be treated as though it were an interval-level variable and, in some cases, even a ratio-level variable.

The relevant statistics reveal an association between size of firms and organization. This association is positive (the cross-

tabulation table is set out so that the category of public corporation is ordinally higher than that of private corporation), that is, larger firms are public while smaller firms are private corporations. Furthermore, we find we can reduce our uncertainty concerning size of firms by as much as 49 percent if we know that they are private or public corporations. But if we know their size our prediction concerning their organization is improved by only 20 percent. Taking into account the positive (and "strong" - see the value of gamma) relationship between the two variables, we can express the above finding in a different way, namely, whereas public corporations tend to command mostly larger assets, firms with larger assets are not equally often public corporations. This is a case of an asymmetric relationship which occurs frequently in economics and other social sciences. For example, Canadians have high incomes but people who enjoy high incomes are not necessarily Canadians.

5. Size of firms and the founder/nonfounder characteristic of chief executives

The founder/nonfounder variable is another dichotomy. The relevant statistics indicate no relationship between the two variables. In our sample of 60 small firms, 80 percent of chief executives were the original founders of their businesses but this information evidently does not help us at all to explain the size of their firms. In this sense, this attribute is "neutral".

6. Size of firms and formal education of chief executives

The formal education variable is set out in an ordinal way: the

lowest educational achievement is "some primary" and the highest is a Ph.D. degree.

Kendall's tau C is significant at the 3.4 percent level. We therefore conclude that there exists an association between size of firms and the educational achievement of their managers; however, the relevant reduction-in-error statistics take negative values. This means that better educated managers tended to run smaller firms and vice versa. Evidently, a factor is inherent in formal education (and it is positively related to it) which induces persons with greater endowment of it to operate smaller enterprises. We conjecture that these individuals may be concerned more, than less educated individuals are, with the efficiency performance of their firms or they may be more jealous of their independence. Hence, they keep their firms relatively small. As we argued elsewhere in this Study, smallness goes hand in hand with efficiency and independence. There must be other possible explanations of the observed proclivity but, without further research, they are difficult to detect.

We note also that Sommers' asymmetric of education on size of firms is larger than its counterpart. Specifically, our knowledge of education improves our prediction of size of firms by 34 percent, but if we attempt to predict the level of education of managers from our information on size of businesses they command, this percentage is only 11. This means that, whereas better educated chief executives tend, in general, to run smaller firms, such firms may be operated by less educated managers.

The crosstabulation statistics show that the chief executives who

had a university degree - 83 percent of the total - were managing firms of all sizes. Beyond this, the distribution shows a considerable variability, for example, two individuals who had, respectively, some primary education and primary education, managed, one a very small firm and one (the latter) a very large enterprise.

7. Size of firm and type of education of chief executives

The type of education variable, which has several categories, is not susceptible to ordering. It would be presumptuous to postulate, insofar as an explanation of size of firms is concerned, that geology, for instance, is superior (inferior) to geophysics or that economics and commerce is superior to fine arts. The eight categories of education - the independent variable - are, therefore, a typical nominal and Eta is the appropriate measure of association. The value of the correlation ratio reveals that 20 percent of variance in assets can be explained by types of education and the value of the Eta coefficient is 44 percent. These statistics indicate a fairly close relationship between the two variables. This is all we can say because, to reiterate, type of education is a nominal variable. Additional information is obtained in the corresponding crosstabulation table. It shows that geologists and geophysicists operated firms of all sizes. Similarly, engineers run all size businesses, with the exception of the smallest unit.

8. Size of firms and years of experience of chief executives with the majors

Both variables are ordinal level and the appropriate significance

Table 6.1 (continued)

SPSS crosstabulation analysis of association between value of assets per firm (A) and interview inputs (B)

	(8) Experience	(9) Relative salaries	(10) Relative wages	(11) Type of innovations	(12) R&D expenditures	(13) Government intervention	(14) System of collecting
1. Raw Chi Square	25.844	25.421	18.654	27.968	7.978	22.706	35.338
Degrees of Freedom	32	24	24	16	8	16	32
Significance	.770	.383	.770	* .032	.435	.122	.313
2. Cramer's V	.328	.375	.321	* .423	.364	.435	.383
3. Contingency Coefficient	.548	.545	.487	* .564	.342	.524	.608
4. Lambda (Asymmetric)							
With A dependent	.980	.078	.098	* .098	.039	.098	.118
With B dependent	.043	.138	.107	* .160	.000	.000	.035
5. Lambda (Symmetric)	.081	.100	.101	* .118	.034	.085	.088
6. Uncertainty Coefficient (Asymmetric							
With A dependent	.090	.121	.094	* .131	.041	.083	.147
With B dependent	.194	.227	.190	* .291	.247	.371	.249
7. Uncertainty Coefficient (Symmetric)	.123	.158	.126	* .181	.071	.136	.185
8. Kendall's tau B	- .029	.154	- .251	.014	.075	.180	.167
Significance	.391	.072	.010	.448	.250	.052	.056
9. Kendall's tau C	*- .025	* .153	*- .242	.015	.064	* .124	.157
Significance	.391	.072	.010	.448	.250	.052	.056
10. Gamma	*- .043	* .203	*- .340	.019	.177	* .387	.218
11. Somers' D (Asymmetric)	*	*	*			*	
With A dependent	- .038	.182	- .305	.017	.156	.345	.194
With B dependent	- .023	.131	- .207	.011	.037	.094	.143
12. Somers' D (Symmetric)	*- .029	* .152	*- .246	.014	.059	.148	.165
13. Eta							
With A dependent	.112	.260	.311	.099	* .065	* .184	* .500
With B dependent	.314	.417	.468	.471	.365	.469	.400
14. E^2 (with A dependent)					* .004		* .250
E^2 (with B dependent)							
See Table	3.13			4.4	4.5	5.1	5.6

* denotes the association measures, and their significance tests, used in our interpretation.

tests show no association between them. The result is not entirely unexpected because there are no theoretical grounds on which one could hypothesize that more experienced executives would tend to control, for instance, larger firms. What could be expected is that, by comparison with less experienced people, they would tend to be more efficient, but this is a different matter altogether.

The crosstabulation table shows that the executives who had more than two but less than ten years of experience with the majors (28 percent of the total) and those with more than ten years experience with the majors and government (12 percent) managed firms of all nine sizes. Interestingly, two individuals who had no previous experience at all managed, one, the smallest and, the other, the largest size firms.

9. Size of firms and relative managerial salaries

The relative salary variable stands for the assessment made by the businessmen interviewed of the level of their current managerial salaries relative to the salaries they would expect to receive for comparable work, if employed with the majors. It should be borne in mind that in reacting to this issue the respondents relied on a quick self-appraisal. Hence, the responses, presumably, encapsulate some biased judgements. The variable in question can be treated as ordinal because the answers were grouped into categories of: "lower", "comparable" and "higher". Kendall's tau C is significant at the level of 7.2 percent, viz., above the maximum level of probability that we are using in this analysis. Hence, to be consistent, we must conclude there is no association between the two variables.

The corresponding crosstabulation tells us that the firms, whose managers stated they would obtain lower salaries if employed with large corporations, were of all sizes.

10. Size of firms and relative wages of labour

The relative wage variable are the assessments made by the chief executives interviewed of the wages they pay to their labour in relation to those paid by large corporations in the industry for comparable work. And it is an ordinal variable. Kendall's tau C is significant at 1 percent level, hence, size of firms and relative wages are associated. It will be observed that Kendall's association measure is negative. On this evidence, firms which pay higher relative wages tend to be smaller and vice versa. This finding, perhaps, may be explained by the fact that smaller firms pay lower fringe benefits to their labour, than larger units do and, moreover, may provide somewhat poorer working conditions. They are thus compeled to compensate their labour with relatively higher rewards. If they also experience a higher turnover they will pay higher wages in an attempt to keep their workers.

Sommers' asymmetric reveals that our knowledge of the relative wage improves our understanding of size of firms by 30 percent. And, if we try to explain relative wages, on the basis of our knowledge of size of firms, the percentage improvement in this prediction is lesser, being 20 percent.

The crosstabulation table reveals that the firms which paid comparable labour rewards were of all sizes.

11. Size of firms and types of innovations

The innovation variable can be treated as an ordinal one because it has three qualitative categories. Its "lowest" quality are internal or "in-house" innovations which become incorporated into the current processes of production. The second category - "better" quality innovations - are engineering modifications made to the existing machinery and equipment that is used by the firm. Finally, introduction of entirely new products, services or technologies stands for the "best" quality innovations. Mostly, but not as a rule, these innovations absorb specialized resources, their cost is high, and they are patented.

A glance at the association measures and statistical significance tests shows that raw chi-square is significant below the 5 percent level. As indicated on the outset of this Section, this test, which has been developed for weak variables, can be used for ordinal variables, but when this procedure is followed, they are treated as nominal ones, since distances between categories are ignored.

According to chi-square test there exists a systematic relationship between the size of firms and the three types of innovations and it is positive, which means that larger firms generate better quality innovations than smaller firms do, and vice versa. The above finding is also documented by Cramer's V which takes values from 0 to 1.0. This measure can be used to ascertain the strength of a relationship. Its value of .48 indicates that the association here examined is fairly strong. The contingency coefficient, like Cramer's V, has a minimum value of 0 but the maximum value it can take depends on the size of the table, i.e. for a

2 x 2 table the maximum value is .707. Our table is a rectangular (9 x 3), and we can only guess that the value of .56 indicates a non-weak relationship between the two variables. The asymmetric lambda, which takes a maximum value of 1.0, measures the percentage improvement in our ability to predict the value of the dependent variable once we know the value of the independent variable. It transpires that, if we attempt to predict size of firms from our knowledge of the most important type of innovations they generate, this prediction is improved by some 10 percent. But if we try to predict the most frequent type of innovations that the firms make, from our knowledge of their size, the corresponding percentage improvement is larger, being 16 percent. The asymmetric interaction between size of firms and the major type of innovation is also measured by the asymmetric uncertainty coefficients which take a maximum value of 1.0. The relevant statistics tell us that the proportion by which "uncertainty" in the dependent variable is reduced by the knowledge of the independent variable. This approach is similar to that taken by lambda, except that the uncertainty coefficient considers the entire distribution, not the mode alone.

12. Size of firms and R & D expenditures

It is of interest to investigate the relation between these two variables because it is generally upheld that, to some extent at least, expenditures on research and development are conducive to a better output of innovations. The R&D expenditures variable is a dichotomy since it has only two categories, viz., "none" and "some". Eta, and Eta square do not indicate an association between the two variables.

On this evidence, the size of firm, in the small-firm sector, does not influence the level of R&D expenditures. If the expenditures vary among firms, this is due to other factors. Some managers may be simply more research and development inclined than others, or perhaps the innovative effort yields better rewards in some outputs than it does in others.

The remaining variables, that we have associated with assets, are the responses we have received during interviews to several questions dealing with the role and policies of government. These reactions are given in Section 5 of this Study, where the corresponding condescriptive data are discussed. With the exception of two variables to be examined presently, no association was found with size of firms.

13. Size of firms and government intervention

The answers we received concerning the extent of government intervention are grouped under three categories, namely, "No comment", "neutral" and "excessive". There exists a positive association between size of firms and the "intervention" variable. Evidently, larger firms found the impact of government interference more severe than did smaller enterprises. We have no plausible explanation of this finding. We also observe that our knowledge of chief executives' opinion on the impact of government interference improves our prediction of the size of their firms by 34 percent. If, however, we attempt to predict the opinion of the executives from the size of their firms, the resulting improvement is only 9 percent.

14. Size of firms and the present system of collecting information from small firms by the government

The system variable consists of five categories, for example, "excessive number of forms", and "unnecessary detail". This variable is nominal because it evades any ordering by quality, intensity or other criteria.

Eta square tells us that 25 percent of variance in the size of firms is explained by the independent variable - the expressed categories of criticism of government system of data collection from small firms. The value of Eta (.50) lies halfway through the range of values that Eta can take. It would thus appear that there is an association between the two variables.

Notes to Section 6

1. Statistical Package for the Social Sciences, N.H. Nie, C.H. Hull, J.G. Jenkins, K. Steinbrenner and D.H. Bent, McGraw-Hill, 1975.

I am indebted for advice concerning the interpretation of the data to Dr. B.E. Dunn, Department of Psychology, Dr. M. Nosal, Director of the Statistical Consulting Laboratory, Department of Mathematics and Statistics and Mr. J. Vrbik, Computer Science, all of The University of Calgary. The responsibility for any misinterpretation is entirely my own.

SECTION 7

A COMPARATIVE STUDY OF THE FINANCIAL PERFORMANCE OF SMALL AND LARGE FIRMS, 1976

For the purpose of this Study, we took a sample of 65 oil and gas companies with assets ranging from $37 thousand to $10 million in 1976 and another sample of 51 corporations with assets from $13 million to $95 million.* The former are our "small" firms and the latter our "large" firms.

The average large firm which had assets of some $23.9 million was about nine times larger than the average small firm which had assets of $2.7 million. It would appear to us that the two samples can be meaningfully compared regarding their financial performance. Later, we will compare the results for our small firms with those for very large corporations and the largest corporations in the petroleum industry. This will be like comparing a mouse with an elephant. The largest corporations in the industry have assets running into billions of dollars.[1] For example, the total assets of Shell Canada were $1.7 billion in 1976. By asset-size, this multinational was 629 times larger than our average small firm. Hence, any comparisons of the financial performance of our small firms with that of very large corporations must be done with caution.

The required data were extracted from the published Annual Reports which are maintained on an historical basis and have not been adjusted to reflect the effects of inflation. A few small firms did not publish annual reports and we relied on the financial information

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* See Appendix 2 and Appendix 3

provided by these firms in special accounting forms we prepared for this purpose.*

We estimated several financial ratios for the 116 units in our two samples and we analyzed the structure of their sources and allocation of funds. The data for the former were extracted from the "Consolidated Statement of Earnings" and "Consolidated Balance Sheet" and those for the latter from "Consolidated Statement of Changes in Financial Position". Due to data limitations, especially for small firms, we could not always obtain the desired results for all the firms. As will be seen, the number of firms for which the required results were obtained is at times a small proportion of the total, furthermore, this proportion is not always the same for our small and large enterprises. As we proceed with our analysis, we will explain as much as possible the principal reasons for this variability.

A factor which should be kept in mind while interpreting the results is that firms differ in their accounting practices. Two methods of accounting are used in the industry, that is, the full-cost method and the successful-efforts method. According to the full-cost method, all costs incurred in the exploration of oil and natural gas reserves, including exploration overheads, are capitalized whether productive or unproductive (dry wells). Proceeds on disposition of properties are usually deducted from costs without recognition of profit or loss. The successful-efforts method provides for capitalizing only those costs which result directly in the discovery of oil and natural gas reserves while all other costs are charged to expense as incurred. Property acquisition costs are retained on the books until the properties are

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* See Appendix 4

surrendered. To put it differently, the users of the full-cost principle (mostly smaller and medium size companies) amortize all exploitation costs over the life of all of the firm's oil and gas reserves. But the corporations which adhere to the successful-efforts method (mainly large firms), charge off the costs of successful exploration against current income for the year in which they are incurred. The two approaches reflect radically different philosophies and define the concept of capital assets in a different fashion. Under the successful-efforts method, the capital assets are the individual successful wells but under the full-cost principle, the capital assets represent the sum total of all the reserves in the ground. No attempt has been made in this Study to reconcile the two accounting methods. Forty-four small firms (or 68 percent of the total) and 15 large firms (29 percent) followed the full-cost method.

Recently, the issue of accounting in the petroleum industry, and a need for standardization of the accounting practices, has received attention.[2] A universal adoption of the successful-efforts principle was proposed by the Financial Accounting Standards Board, the rule-making body of the accounting profession. The reaction in some quarters of the industry has been that the FASB does not understand the business. Views were expressed that the recommendation of the Board could badly cripple the Canadian and U.S. industry. It appears that if the recommended method were universally adopted, it would cause the apparent profits of small oil companies to fall drastically. In consequence, it would be hard for them to raise the risk capital.

A time series statistical analysis would have been preferable to

Table 7.1

Financial ratios, 65 small firms, the oil and gas industry, Canada, 1976

		Positive		Negative		Net	
		No. of firms	Means	No. of firms	Means	No. of firms	Means
1. The effective income tax rate	%	16	26.2				
Profitability tests							
2. The rate of return on owners' equity	%	30	16.6	22	42.9	52	-14.9
3. The rate of return on total assets	%	36	11.6	24	13.2	60	+ 1.6
4. The leverage	Percentage points	33	5.0	23	29.7	56	-16.5
5. Earnings per share	$	27	1.18	22	0.53	49	+ 0.65
Liquidity tests							
6. The current ratio		58	1.63				
7. The acid ratio		57	1.13				
8. The average collection period	days	57	210				
Solvency tests							
9. The debt/equity ratio		37	0.45				
10. The long-term debt to total capitalization ratio		34	0.40				

Source: Annual Financial Statements and other sources.

Table 7.2

Financial ratios 51 large firms, the oil and gas industry, Canada, 1976

		Positive		Negative		Net	
		No. of firms	Means	No. of firms	Means	No. of firms	Means
1. The effective income tax rate	%	29	34.3				
Profitability tests							
2. The rate of return on owners' equity	%	48	17.0	2	3.8	50	+16.1
3. The rate of return on total assets	%	50	9.3				
4. The leverage	Percentage points	46	7.6	4	3.3	50	+ 7.0
5. Earnings per share	$	46	1.3	2	0.6	48	+ 1.3
Liquidity tests							
6. The current ratio		47	1.96				
7. The acid ratio		49	1.83				
8. The average collection period	days	48	113				
Solvency tests							
9. The debt/equity ratio		20	0.69				
10. The long-term debt to total capitalization ratio		43	0.37				

Source: Annual Financial Statements and other sources.

the method of cross-analysis with reference to one single year - 1976 - that we have used. Whereas, we had readily available data for that year for a sample of 65 small enterprises, unfortunately, we could not secure the required statistics for a sufficiently large sample of small firms and over a satisfactorily long period of time to apply a time series analysis. We used the material that was available to us. A cross analysis is not without merit. It shows the differences that exist between small and large firms at a point in time. The data capture the effects of many important influences which, with the use of our method, cannot be analyzed over time. The impact of these influences is, nonetheless, present and can be studied. A cross-sectional analysis need not be less meaningful and revealing than a time series analysis. Each has its own merits and shortcomings.

Financial ratios

Tables 7.1 and 7.2 show estimates of several financial ratios,[3] respectively, for our small and large firms. And Table 7.3 compares these results with the corresponding estimates of two other studies for groups of firms of different sizes.

The effective income tax rate is the ratio of current income taxes paid to net earnings before income taxes. It differs from the nominal rate because businesses claim deductions which lower taxable income. For many small and some large firms this ratio could not be meaningfully estimated. Seventeen small firms, or 26 percent of the total, recorded negative net earnings before taxation and 32 units, or 49 percent, did not pay income taxes currently. As a result, we were

able to obtain an estimate of the effective income tax rate for only 16 small "successful" oil and gas enterprises, namely, those firms that made positive net earnings before taxation and also paid current income taxes. They represent only 25 percent of the total.

The fact that just over a quarter of our small firms made losses in 1976 is predictable and should not be interpreted to indicate that small firms in general are inefficient and unprofitable. A small explorer-exploiter-developer, if it makes an accounting loss in a particular year, may still be a viable and profitable concern in the long run, and efficient all the time. The firm may be a vibrant investor and its negative net earnings (gross earnings after expenses but before taxation) may simply reflect, for instance, heavy acquisitions of capital and land or the inevitable time-lag of revenues behind costs typical for investments which have a long period of return-gestation. But some losses are ominous signs of a pending financial disaster if they are recurrent and, moreover, if they are the consequence of an inefficient use of resources and other managerial disabilities. At times a firm may be pestered with bad luck in the sense that it finds unproductive wells. Whatever the reason, such firms may have to quit eventually. It is important to realize, and this point cannot be easily overstressed, that it is at the level of the small firm, which is the breeding ground for future large enterprises, that the process of ruthless elimination of the unfit occurs - thrusters are rewarded and sleepers are penalized. Only an analysis of the longitudinal data would permit us to sort out the two categories of performers.

The businesses which did not pay current income taxes used their

Table 7.3

Financial ratios, large and small firms, the oil and gas industry, Canada, 1976.

	This study		I P A C				Wood Gund
	Small	Large	All	Producers	Senior Producers	Integrateds	
No. of firms	65	51	33	15	8	10	35
1. The effective income tax rate	26.2	34.3	30.7	35.0	30.6	30.2	41.0
Profitability tests							
2. The rate of return on owners' equity %	16.6	17.0	14.7	13.4	20.1	13.1	16.0
3. The rate of return on total assets %	11.6	9.3	11.7	10.6	13.8	11.0	9.2
4. The leverage Percentage Points	5.00	7.70	3.00	2.80	6.30	2.10	6.8
5. Earnings per share $	1.18	1.33	-	-	-	-	1.6
Liquidity tests							
6. The current ratio	1.63	1.96	1.80	1.55	1.44	1.93	-
7. The acid ratio	1.13	1.83	-	-	-	-	-
8. The average collection period days	210	113	-	-	-	-	-
Solvency tests							
9. The debt/equity ratio	0.45	0.69	0.34	0.32	0.62	0.25	-
10. The long-term debt to total capitalization ratio	0.40	0.37	0.25	0.24	0.38	0.20	0.2

Source: Annual Financial Statements, and other sources.

accumulated deferred income tax claims to reduce their current tax liabilities to zero. For many years there may be no revenues but, in the meantime, capital assets are acquired and expenditures of other natures are made which generate the claims. Or, if there are revenues, the current income tax claims may exceed the current tax liabilities. Firms tend to accumulate deferred income tax claims on account of depreciation and amortization of their capital assets, depletion, capital cost allowances, exploration and R&D expenditures.

As will be seen from Table 7.2, we obtained an estimate of the effective income tax rate for 29 of our large firms, that is, 57 percent of the total. Two large firms made a loss in 1976 - a very small percantage of the total (4 percent) by comparison with this percentage for small firms (to reiterate, 26 percent). Twenty large firms, or 39 percent[4] of the total, did not pay current income taxes. Compare this with the corresponding percentage for small firms of 49. It transpires that small firms recorded a much higher proportion of "losers" than did large firms, and that a larger proportion of the former did not pay taxes.

Table 7.3 shows that the effective rate of income tax was lower for our small (successful) businesses than it was for our large corporations. These rates were, respectively, 26 and 34 percent. In that table, the relevant results of two studies for the oil and gas industry are reproduced for the sake of comparison. The average effective income tax rate for the Wood Gundy study of 35 largest publicly owned petroleum companies[5] for the year 1976 was 41 percent. The sample of firms used in that study included several giant firms but none of our small firms. The second study is by the Independent Petroleum Association of Canada

for the year 1976.[6] Various data are given in that study for a group of 33 petroleum corporations split up into three subsets, namely, "integrateds" (10 very large firms), "senior producers" (8 intermediate-size firms) and "producers" (15 small firms). Very roughly only do the IPAC producers correspond to our large firms. Using the data given in the IPAC study, we estimated the effective income tax rate for the above three groups of firms.

Both our estimates of the effective rate for the individual firms and those of the Wood Gundy study display a striking variability. The lowest estimate of this rate in the Wood Gundy study was 3.9 percent and the highest was 90.3 percent. The corresponding range for our small firms was from 3.6 to 53.7; for our large firms, from 0.9 to 90.0.

When comparing our results with the IPAC and Wood Gundy results, the following considerations become pertinent. First, all the estimates for the individual groups of firms have been affected by the different methods of accounting used in the industry, to reiterate, the full-cost or successful-efforts method. Second, not all the firms in our sample of small businesses provided in their accounts all the required detail. We used what was available. Clearly, the inter-group comparability of results has been somewhat adversely affected. Third, when comparisons will be made between the results for our "successful" small firms (the firms that made positive net earnings and paid current taxes) and the results for the IPAC and Wood Gundy groups of firms, we will be comparing the "best" performers among the small firms with the average performer in the other groups. Only comparisons between the best performers in all groups would be valid. Fourth, in some series of data

for our small firms there were outriders which we excluded from calculations. To leave such outliers in would strikingly and unrealistically influence the averages. The difficulty that confronted us was a complete lack of previous studies of small firms in the oil and gas industry. Hence, we were not in position to have even a very general idea (hopefully always "without prejudice") of what might be expected. However, there is a distinct possibility that our decisions as to what were the "true" outriders in a particular series of data might have introduced a bias into the results.

It will be noted from Table 7.3 that the result for our large firms comes very close to that for the IPAC "producers". This group of the smallest IPAC firms, actually recorded the highest rate of effective income tax of all the three IPAC subsets. It would appear, on this evidence, that larger firms pay lower effective income tax rates. However, if we take into account the result for the Wood Gundy largest corporations in the industry, the average for the IPAC 33 firms and the results for our large and small "successful" firms, the rate of effective income tax in the oil and gas industry appears to be positively correlated with size of firms.

Our small firms benefit from lower corporate tax rates. They probably benefit to the same extent as their larger counterparts from capital cost allowances (CCA) because they are highly capital-intensive. An operator in exploration, drilling and development tends to be capital-intensive regardless of its size. And both small and large units benefit from accelerated income tax write-offs on exploration and development costs. On <u>posteriori</u> grounds, it transpires, that our

"successful" small firms have benefitted more on the net on these various counts than did larger units.

Small firms in Canada benefit from a "small business deduction" (Section 125 of the Income Tax Act). While the normal corporate rate of income tax is 46 percent, small units are subject to a tax rate on their retained business income of 25 percent up to an annual limit of $150,000, and until the retained income exceeds a cumulative sum of $750,000.* To the extent that they are also capital-intensive, small enterprises claim CCA, which is designed to allow the recovery, out of income earned, of the expenditures incurred in acquiring plant, machinery, equipment and other assets. The Act specifies rates for different types of assets which apply to a diminishing balance of their total historical cost. The CCA reduces taxable income and, ultimately, the amount of the tax to be paid.

The results shown in Table 7.3 indicate that none of the groups of large firms (including our large firms) paid the nominal corporate income tax rate of 46 percent. However, our small "successful" firms paid an effective rate which was one percentage point above the nominal special small business rate of 25 percent. If one relates the effective rates for small and large businesses to the respective nominal rates that are applicable to them, the conclusion would be that the present system of tax rates and tax deductions favours larger enterprises.

Some estimates indicate that in manufacturing the effective income tax rate for the large business is lower than it is for the small business.[7] An explanation of this finding, probably, derives from the

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* The two limits have been increased recently.

fact that large manufacturing corporations tend to be highly capital-intensive and, for this reason, they benefit a great deal from CCA. Moreover, if capital investments are progressively accelerated, the deferred taxes which result from CCA accumulate at a fast rate. This is advantageous to large corporations for whom growth is paramount. Furthermore, in periods of inflation, deferred taxes are repaid with declining purchasing power dollars. Clearly, since CCA lowers taxes, and yields other benefits, it encourages accelerated investment.[8] It follows that, in an industry like manufacturing, where small enterprises are labour-intensive while large corporations are highly capital-intensive, the benefits from CCA accrue primarily to the latter firms which also pursue more vigorously the strategy of growth. But small, even the smallest firms in exploration and exploitation of petroleum resources, tend to be highly capital-intensive. Hence, the impact of this factor is different in the oil and gas industry than it is in manufacturing and there are no a priori reasons to think that small enterprises benefit to a lesser extent from CCA than do large firms.[9]

We turn now to some profitability tests.

The rate of return on owners' equity is obtained by relating net earnings after taxes and before extraordinary items less preferred stock dividends to average net worth (owner's equity) less par value of preference stocks and less intangible assets.[10] This rate is a measure of the earning power on shareholders' book investment and is frequently used in comparing the performance of different firms. Some analysts regard this ratio as a fundamental test of profitability because it

relates income to the amount of investment that was committed to earning it.

We obtained positive percentages for 30 small and 48 large firms. Tables 7.1 and 7.2 show the means - positive, negative and net - for the two groups of firms. If desired, using these results, comparisons, additional to those that will be made presently, can be made between large and small firms.

Table 7.3 records that our small "successful" firms achieved nearly the same rate of return on owners' equity as did our large firms.[11] The corresponding data for the IPAC and Wood Gundy studies, taken together with our data, do not reveal a relationship between the size of firms and the rate of return. On the one hand, the IPAC's "senior producers" performed much better than the "integrateds" and "producers". On the other, the Wood Gundy largest corporations in the industry recorded a higher return than that for the IPAC "integrateds", but slightly lower return than that for our small units.

Taking the results as they stand, our "successful" small firms have performed comparatively well. The explanation of this finding stems from a complex of factors which were examined in some detail pari passum in this Study and which give to the owner of a small enterprise uniquely strong incentives to use its resources efficiently: the individual is the founder of the firm, the capital of the firm is his own, he wields a comprehensive control of the firm's operations, and his income is directly related to the net earnings of the firm. He thus identifies himself with the firm to an extreme degree. A small enterprise also benefits from the economies of specialization.

In contrast, the management of a large enterprise is not motivated by similar efficiency incentives and its activities may be highly diversified. However, the economies of scale benefit larger units. Evidently, our large units did not enjoy sufficiently strong economies of scale to offset their relatively weaker efficiency incentives and absence of the economies of specialization. It may be of some relevance to note that, among the groups of large firms, the highest rate of return on owners' equity was achieved by the IPAC's "senior producers". This may suggest that as size of firms increases in the oil and gas industry, the economies of scale are the strongest at the intermediate-size level and then they begin to taper off.

All the above notwithstanding, our data show that small enterprises can do poorly; in consequence, they quit, bankrupt or continue their existence at a survival level (the "living dead"). In the absence of longitudinal data it is impossible to identify such cases. As seen in Table 7.1, a negative rate of return on owners' equity for the 22 firms, which made losses in 1976, was 43 percent. And the net return for all the 52 small firms, for which we had the required data, was a negative 15 percent. When this rate is compared with the positive rates of return on owner's equity for the groups of large firms shown in Table 7.3 (including our large firms), on this evidence, the performance of small firms was dismal. However, at the cost of repetitiveness we wish to reiterate that the data for small businesses for one year do not separate, in any sense, long-run winners from long-run losers, quitters, bankrupters and the "living dead".

The second rate of return that we estimated is that on total assets.

This profitability test is the ratio of net earnings (after taxes and before extraordinary items) plus interest (net of tax) to average total tangible assets. Tangible assets include deferred income taxes, other deferred credits and minority interest in subsidiaries. This ratio is also known as the rate of return on (average) capital employed as it includes not only the shareholders' equity (as does the previous ratio) but also the creditors' equity. For this reason, some analysts tend to view it as a fundamental measure of the management's performance.

The rate of return on total capital employed was higher for our 36 small "successful" firms than it was for our 50 large firms, by 2.3 percentage points. It will be noted that whereas 24 small firms recorded a negative rate (Table 7.1), this rate was, nonetheless, positive for all 60 small units (1.7 percent).

Comparing our results with those of the IPAC and Wood Gundy studies, we see that our "successful" small firms performed as well as the IPAC's 33 corporations and much better than the Wood Gundy industry's giants.

Again, the results do not indicate a discernible relationship between the rate of return on total capital and size of businesses.[12] However, if we consider the disaggregated IPAC data alone we see that "producers" and "integrateds" performed at a comparable level, while "senior producers" recorded the best performance of all groups. We noted the same relative performance earlier in connection with the rate of return on owners' equity. On this very limited evidence, one could tentatively assert that, in the petroleum industry, the economies of scale generate the highest return on total resources at the level

of the intermediate-size firm.

The so-called leverage is the difference between the rate of return on owners' equity and that on total capital. The two returns differ only because of the effect of liabilities. When the return on owners' equity exceeds that on total investments or total capital, the leverage is a special advantage. For, when the cost of total debt (interest expense net of tax) is lower than the rate of return on total investment earned by the company, the difference accrues to the benefit of the owners. This is one reason why positively levered companies adopt a strategy of obtaining from creditors an appropriate amount of the resources needed.

All the groups of firms shown in Table 7.3 achieved a positive leverage. Table 7.1 indicates that 23 small firms had a negative leverage of 30 percentage points and that the leverage for all 56 small firms was a negative 16.5 percentage points (the small firms, as a group, earned a lower rate of return on owners' equity than they did on total investments, respectively, -14.9 and 1.6 percent).

The "successful" small firms recorded a positive leverage which was lower than that for our large firms and the Wood Gundy corporations but higher than the average leverage for the IPAC's 33 units. These firms could, therefore, be expected to adopt a policy of obtaining external finance as long as the average cost of debt capital was lower than the rate of return on total investments. They actually earned in 1976 a return of 11.6 percent on their total investments. In that year the interest expense net of tax of borrowed funds to them was 10.0 - 11.0 percent. It would thus appear that external borrowing at that time

would have benefitted their shareholders. However, whether external borrowing is or is not beneficial to the shareholders depends on the long-term rate of return on total investments in relation to the long-term cost of debt capital, because this capital is repaid over long periods of time.

The last test of profitability is earnings per share expressed as a ratio of net income after taxes and before extraordinary items to average number of common stock shares outstanding. As usual we had problems with our small firms, for example, in such units equity shares may be held internally and their (nominal) number may be very small, indeed. In consequence, the earnings per share become a striking outlier which, if not ignored, would overestimate seriously the average for the group. Again, in small firms, internal common stock shareholders may get a return in a disguised manner. This return may be embedded in withdrawals, management salaries or special bonuses which are buried somewhere in the accounts. The "earnings per share" may thus stand for a different concept in these enterprises than that which applies to larger firms. In consequence, the results tend to be biased.

As can be gleaned from Table 7.3, the 27 "successful" small firms, for which we had the data, achieved lower earnings per share than our large firms. Also, by comparison with the average for the Wood Gundy 35 largest firms in the industry, our small firms performed poorly. As will be seen from Table 7.1, the net return for all 49 small firms, for which we were able to make the estimate in question, was actually positive and equal to 65 cents.

Our analysis of the profitability tests, discussed above, provides no evidence that small firms are, in general, any less efficient than large, or vice versa.[13] Throughout, we have spelled out all the caveat emptors' to which our results are subject.

We turn now to two liquidity tests. The first is the so-called working or current capital ratio which is the ratio of current assets (cash, marketable securities, receivables, inventories and prepaid expenses) to current liabilities. This test of the present cash solvency of the firm indicates its ability to meet short-term obligations and to remain solvent in the event of unheralded adversities. To put it differently, it measures the adequacy of the cushion of working capital maintained by the firm in order to allow for the inevitable unevenness in the flow of funds through working capital account.

The findings show that our small firms were less liquid than our large firms and the average IPAC firm but more liquid than the IPAC producers and senior producers.[14]

It would appear that the current ratio for our small firms may be overestimated. Supposedly, the higher it is the greater is the ability of the firm to pay its bills. But the ratio is a crude measure of the liquidity of the components of the current assets. A firm having current assets consisting primarily of cash and short-term marketable securities would be more liquid than another firm whose current assets are foremost accounts receivable and inventories which tend to be illiquid in general. Cash and marketable securities have, of course, the same liquidity for all firms, whatever their size, but accounts receivable and inventories may vary in their degree of liquidity

quite markedly among firms. An examination of the composition of the current assets for the firms in our sample reveals that the accounts receivable are a more important item in the total current assets of small firms than they are in those of larger firms. Hence, the liquidity of these items is more critical to the total liquidity of the current assets in the case of the former firms than it is in the case of the latter. Furthermore, we find that the liquidity of receivables in small firms is lower than it is in large firms. This is shown by the value of the average collection period given in Table 7.3 for our small and large firms.

This period is estimated as the ratio of receivables, multiplied by 365 (days in year), to annual credit sales. It is 113 days for our large firms and as many as 210 days for small firms - almost twice as long. One explanatory factor in the situation seems to be a better system of collection of receivables that is employed by big enterprises. They have resources to do so and, moreover, having more market control they can exert pressure on the defaulting creditors. But small independents are at a disadvantage in this respect; not surprisingly, they take almost seven months on the average to clear their receivable accounts. During our interviews we were often told by the executives of small firms that the uncollected receivables create a standing financial dilemma.[15] However, small enterprises often have no power to collect and also are not willing to put pressure on their creditors in a competitive environment in which they operate. Goodwill in this respect must be maintained for the sake of future deals and litigation absorbs resources and may scare off potential customers.

The second liquidity test we attempted to estimate is the so-called quick or acid ratio. This ratio is different from the current ratio because it relates cash, marketable securities and receivables to current liabilities. In this respect it provides a more penetrating measure of liquidity than the current ratio. As seen, the ratio in question was lower for our small firms than for our large firms. The reason that we suggested for a probable overestimate of the current ratio, applies also to the acid ratio.

Next, we estimated two long-term solvency tests. These tests provide information on the firm's ability to meet its long-term obligations on a continuing basis.

The first test is the debt-equity ratio which relates creditors' equity to average tangible net worth or owners' equity. This ratio turns out to be higher for our large firms than for our small firms. The former units had creditors' liability of 69 cents for each one dollar of owners' equity; the latter, 45 cents. The difference between the two results suggests that large firms would experience more difficulty in repaying their long-term debt. We also note that our small firms would find it more difficult to repay their long-term debt than the 33 IPAC firms would whose creditors' liability was 34 cents for each dollar of owners' equity.

The second solvency ratio is that of long-term debt to total capitalization, namely, long-term debt and owners' equity. This test rests on the relative importance of long-term debt in the capital structure. Debt capital is risky because there are specific maturity dates for the principal amounts and specific interest rates that must

Table 7.4

Sources of funds, 65 small firms, positive results, the oil and gas industry, Canada, 1976.

($s and percentages)

Total funds generated 49,859,253 Value of assets 149,548,867 Mean 2,719,070

1. From operations	No of firms	Totals	Means	%	%	%
a. Net earnings	26	4,519,222	173,816	9.1	33.6	
b. Non-cash charges						
1. Depletion 2. Depreciation 3. Amortization	41	6,449,667	157,308	12.9	48.0	
4. Deferred income taxes	16	1,198,970	74,935	2.40	8.9	
5. Other	15	1,264,936	84,330	2.5	9.4	
Total from operations		13,432,822			100.0	26.9
2. From proceeds						
a. Share issues	26	3,908,375	150,322	7.8	10.7	
b. Long-term debt	25	20,979,652	839,186	42.1	57.6	
c. Sales of property	29	7,041,023	242,793	14.1	19.3	
d. Sales of investments	14	1,419,538	101,395	2.8	3.9	
e. Other	18	3,077,743	170,985	6.2	8.4	
Total from proceeds		36,426,331			100.0	73.1
Total funds generated		49,859,253		100.0		100.0

Source: Annual Financial Statement and other sources.

Table 7.5

Sources of funds, 65 small firms, negative results, the oil and gas industry, Canada, 1976.

($s and percentages)

Total funds generated 4,109,577

1. From operations	No. of firms	Totals	Means	%
a. Net earnings	17	2,645,306	155,606	64.37
b. Non-cash charges				
1. Depletion				
2. Depreciation				
3. Amortization				
4. Deferred income taxes	5	351,672	70,334	8.56
5. Other	12	1,112,599	92,716	27.07
Total from operations		4,109,577		100.0
2. From proceeds				
a. Share issues				
b. Long-term debt				
c. Sales of property		-		
d. Sales of investments				
e. Other				
Total from proceeds				
Total funds generated		4,109,577		100.00

Source: See Table 7.4.

be paid. Both claims are enforceable by law and do not depend on the earnings of the company. In contrast, capital supplied by owners does not give rise to similar obligations. Equity capital is, therefore, viewed as much less risky. Needless to say that, in the long-run, returns on stockholders' equity normally must be higher than interest rates paid on debt capital.

The ratio of long-term debt to total capitalization was slightly lower for our large firms than it was for our small firms. This indicates that the former units tended to use relatively more low-risk capital in the sense explained above.

In summary, our findings indicate that, by comparison with large units, small firms paid a lower effective income tax rate; achieved a comparable return on equity and total capital; had lower liquidity; and were less solvent. The above comments apply to a comparison of the best performers among small firms with the average large performer. When the data for all small firms are compared with those for large firms, the small business is, at times, at a great disadvantage. There are reasons for it which stem entirely from the special position that the small firm sector occupies in the industry. Small firms are subject to a rigorous selection process and are confronted with many financial issues which for large firms are a matter of the past.[16]

Sources of funds[17]

Table 7.4 shows positive sources of funds of our small firms in 1976; Table 7.5, negative sources; and Table 7.6, net sources. Thus Table 7.4 presents the results for the "successful" small businesses,

Table 7.6

Sources of funds, 65 small firms, net results, the oil and gas industry, Canada, 1976.

($s and percentages)

Total funds generated 45,749,676

1. From operations	No. of firms	Totals	Means	%	%	%
a. Net earnings	43	1,873,916	43,579	4.1	20.1	
b. Non-cash charges						
1. Depletion						
2. Depreciation	41	6,449,667	157,308	14.1	69.2	
3. Amortization						
4. Deferred income taxes	21	847,298	40,347	1.8	9.1	
5. Other	27	152,364	5,643	0.3	1.6	
Total from operations		9,323,245			100.0	20.4
2. From proceeds						
a. Share issues	26	3,908,375	150,322	8.5	10.7	
b. Long-term debt	25	20,979,652	839,186	45.9	57.6	
c. Sales of property	29	7,041,023	242,793	15.4	19.3	
d. Sales of investments	14	1,419,538	101,395	3.1	3.9	
e. Other	18	3,077,743	170,185	6.7	8.4	
Total from proceeds		36,426,331			100.0	79.6
Total funds generated		45,749,676		100.0		100.0

Source: See Table 7.4.

solely in the sense that these units had no negative sources of funds, while Table 7.6 presents the results for the average performer in the group because positive and negative sources of funds are netted. It will be noted, at times, we were able to obtain the required data for only a small proportion of the 65 units in our sample. This was due to a lack of detail or absence of information in the accounts used.*

Each table shows three sets of percentages to facilitate interpretation. First, each individual source of funds is expressed as a percentage of total funds generated; second, each source of funds from operations is expressed as a percentage of total funds from operations and similarly for the funds from proceeds; third, funds from operations and proceeds are expressed as percentages of total funds generated.

Table 7.4 records that long-term debt was the single most important source of total funds for our small "successful" firms. This source accounted for 42 percent. Proceeds from sales of property and investments, taken together, came to 17 percent. This aggregate source, which was next in importance after long-term debt, was followed by depletion, depreciation and amortization with 13 percent, net earnings with 9 percent, and share issues with 8 percent. The remaining sources of funds - deferred income taxes and the two "other" items - accounted for 11 percent.

In 1976, small "successful" firms relied to a considerably greater extent on the funds from proceeds (73 percent of total funds generated) than they did on the funds from current operations (27 percent). They went heavily into external long-term debt financing, and were selling property and investments. Given the financial target of

* For some units, individual sources of funds were nil, for instance, the firm did not incur long-term borrowing or it did not sell property.

the enterprises in that year, the cash-flows from operations appear to have been inadequate. As seen, the sources of funds from operations represented only one-third of the total funds generated. Conspicuously, net earnings provided less than 9 percent of this total and about one-third of the funds from operations. But depletion, depreciation and amortization were comparatively more important sources of funds from current operations. They altogether supplied 13 percent of total funds generated and 48 percent of the funds from operations. Deferred income taxes, which provided 9 percent of the operational funding, further assisted the firms in their effort to secure cash-flows.

In 1976 government policies took a turn-about and new fiscal incentives to exploration were implemented. In response to a new climate and new opportunities, small firms, evidently, embarked on a policy of vigorous expansion. Apparently, they were caught in a cash-flow squeeze, presumably the result of repressive pre-1976 official policies. To secure the finance concomitant with their upgraded investment projects, they supplemented their meager cash-flows from operations with extensive new borrowing and selling of property and old investments and, to a lesser extent, floating new share-issues.

So far we have dealt with the "successful" small firms. When we compare Table 7.6, which deals with the aggregate net flows of funds, with Table 7.4 just discussed, we note that the overall relative position of the different sources of funds remains basically unchaged. A notable exception is the share of net earnings in the total funds generated which declined from 9 to 4 percent, as a result of the negative earnings of 17 firms shown in Table 7.5. Another change was in the share of

Table 7.7

Sources of funds, 51 large firms, net results, the oil and gas industry, Canada, 1976.

($s and percentages)

Total funds generated 2,308,983,476

Value of assets 8,740,870,640
Mean 178,385,115

1. From operations	No. of firms	Totals	Means	%	%	%
a. Net earnings	47	571,394,755	12,157,335	24.7	48.7	
b. Non-cash charges						
1. Depletion 2. Depreciation 3. Amortization	46	374,935,447	8,150,770	16.2	32.0	
4. Deferred income taxes	40	156,097,741	3,902,443	6.8	13.3	
5. Other	33	68,145,076	2,065,002	2.9	5.8	
Total from operations		1,172,297,323	23,924,435		100.0	50.7
2. From proceeds						
a. Share issues	28	114,701,213	4,096,471	5.0	10.1	
b. Long-term debt	33	845,655,321	25,625,918	36.6	74.4	
c. Sales of property	28	71,037,594	2,537,056	3.1	6.2	
d. Sales of investments	9	11,736,191	1,304,021	0.5	1.0	
e. Other	33	64,686,834	1,960,207	2.8	5.7	
Total from proceeds	47	1,136,686,153	24,184,811		100.0	49.2
Total funds generated		2,308,983,476	47,122,111	100.0		100.0

Source: See Table 7.4.

funds from proceeds in the total of funds generated which rose to almost 80 percent. This is explained by negative flows of funds - deferred income taxes and "other" - from operations.

Table 7.7 shows the aggregate or net flows of total funds for our large firms. Again, but to a much lesser extent than in the case of small firms, we could not obtain all the required statistics. Two large units recorded negative net earnings; one, deferred income taxes; and twelve, "other" sources of funds from operations. Altogether, these negative flows were small in relation to the corresponding totals, hence, we reproduce the data for net flows only.

A comparison of the results of Tables 7.7 and 7.4 reveals that long-term debt represented again the most important single source of total funds generated - 37 percent (for small firms this percentage was 46). But, whereas small firms supplemented their funds to the extent of 17 percent of the total flows of funds through sales of property and old investments, the corresponding percentage for large firms was only 3.6. A striking difference arises in the respective shares of net earnings in the total funds generated: for large firms it was 25 percent but for small firms it was 9 percent only. The share of net earnings in the total funds from operations was also higher for large units (49 percent) than it was for small enterprises (34 percent). And so was the share of depletion, depreciation and amortization in the total funds generated - 13 percent for small units and 16 percent for large units. It will also be observed that deferred income taxes were a more important source of total funds for large units (7 percent) than they were for small enterprises (2 percent). When we aggregate the two

above-mentioned sources of funds, we see that large firms obtained some 23 percent of their total funding from them while for the small firms this percentage was lower, being 15 percent. On this evidence, large firms relied for their funds more importantly on their cash earnings and non-cash charges than did small enterprises.

The finding that, in the present setting, larger units benefit more from tax write-offs than their smaller counterparts do, and that they have greater accumulated deferred income taxes, may be significant. For, their income tax liabilities are accordingly reduced more and, consequently, their effective income tax rate is lower, other things being equal. It would thus appear that our previous finding that larger firms pay higher effective income tax rates (than "successful" small firms) must be explained mainly in terms of the lower tax rates that smaller firms pay and, possibly, the higher growth rates of larger firms.

An additional difference that obtains between the two groups of firms is shown by the percentages that flows of funds from operations and proceeds, each, represented of total funds generated. We observed earlier that for small firms the latter source was the dominant one. We note now that for large firms the two sources held almost the same shares, 49 and 51 percent, in favour of the funds from operations. It would appear, on the basis of the comparisons we have hitherto made that the share of funds from operations rises (the share of funds from proceeds declines) with the size of firm. We will presently provide more information on this and other relationships between size of firms and the shares of various sources of funds. The relevant statistics

Table 7.8

Sources of funds, shares of total funds generated and other data, small and large firms, the oil and gas industry, 1976.

(percentages)

	This study		IPAC			
1. From operations	Small firms	Large firms	All	Producers	Senior Producers	Integrateds
a. Net earnings	9.1	24.7	34.9	24.7	29.7	40.3
b. Non-cash charges						
1. Depletion 2. Depreciation 3. Amortization	12.9	16.2				
4. Deferred income taxes	2.4	6.8				
5. Other	2.5	2.95				
Total	17.8	25.9	31.2	27.3	27.5	34.2
Total from operations	26.9	50.7	66.0	52.7	57.2	74.5
2. From proceeds						
a. Share issues	7.8	5.0	3.0	13.4	3.9	0.4
b. Long-term debt	42.1	36.6	26.6	30.5	33.0	21.5
c. Sales of assets and other transactions	23.14	6.4	4.4	4.0	5.9	3.6
Total from proceeds	73.1	49.2	34.0	41.9	42.8	25.5
Total funds generated	100.0	100.0	100.0	100.0	100.0	100.0
Net earnings	33.6	48.7	52.9	47.6	51.9	54.1
Non-cash charges	66.4	51.3	47.1	52.4	48.1	45.9
	100.0	100.0	100.0	100.0	100.0	100.0

Source: See Table 7.4.

are given in Table 7.8 for our small and large firms and for the IPAC subgroups of firms.

The following relationships are discernible from the data. First, the share of the funds from operations in total funds generated is positively related to size of firms (the share of funds from proceeds is inversely related to size of firms). The largest units in the industry - the IPAC integrateds - derived from operations as much as 74 percent of their total funds while for our small firms this percentage was only 27. Apparently, as firms grow they increasingly rely on cash-earning and non-cash charges. In the meantime, the relative position of cash-earnings vis-à-vis non-cash charges alters, namely, net earnings become relatively more important. The ratio of net earnings to non-cash items was, at the level of our small firms, .55 but it was 1.18 for the IPAC's integrateds. Second, the share of net earnings in total funds generated rises with size of firms. Compare the 9 percent share in question for our small firms with the 40 percent share for the integradeds. Third, the sources of funds from income tax write-offs and from deferred income taxes, as mentioned earlier, were higher as a proportion of the total funds generated for our large firms than they were for our small firms. Unfortunately, we did not have comparable data for the IPAC groups, hence, we relied on the aggregate data, that is, income tax write-offs, deferred income taxes and the "other" items, taken together. The "other" sources represented 2 percent of total funds generated for our small firms and 3 percent for our large firms. We do not know what these percentages were for the IPAC groups. As seen, the aforementioned aggregate percentage increases

Table 7.9

Allocations of working capital used, 65 small firms, the oil and gas industry , Canada, 1976.

($s and percentages)

	No. of firms	Totals	Means	%
1. Capital expenditures	52	20,369,183	391,715	43.5
2. Acquisitions of properties	11	6,245,071	567,733	13.3
3. Investment and advances	12	4,657,143	388,095	9.9
4. Dividends paid	4	62,533	15,633	0.1
5. Reduction in long-term debt	19	7,287,779	383,567	15.6
6. Deferred production income	1	149,557	149,557	0.3
7. Long-term receivables	7	2,626,867	375,266	5.6
8. Redemption of shares	5	358,093	71,618	0.8
9. Reduction in prepayments	1	73,707	73,707	0.2
10. Drilling costs and other	24	5,021,645	209,235	10.7
Total funds used		46,851,578	867,621	100.0

Source: See Table 7.4

Table 7.10

Allocations of working capital, 51 large firms, the oil and gas industry, Canada, 1976.

($s and percentages)

	No. of firms	Totals	Mean	%
1. Capital expenditures	47	1,169,355,818	24,871,911	53.8
2. Acquisitions of properties	10	159,331,699	15,933,169	7.3
3. Investment and advances	18	158,826,296	8,823,683	7.3
4. Dividends paid	25	142,503,064	5,700,122	7.0
5. Reduction in long-term debt	35	306,987,605	8,771,074	14.1
6. Deferred production income	9	25,522,000	2,835,777	1.2
7. Long-term receivables	7	13,737,000	1,962,478	0.6
8. Redemption of shares	8	3,747,000	468,375	0.2
9. Reduction in prepayments	3	46,400,000	15,466,666	2.1
10. Drilling costs and other	40	210,249,580	5,256,239	9.7
Total funds used	48	2,174,886,062	45,310,126	100.0

Source: See Table 7.4.

Table 7.11

Allocations of working capital used, shares of total funds used, small and large firms, the oil and gas industry, 1976

(percentages)

	This study		IPAC			
	Small Firms	Large Firms	All	Producers	Senior Producers	Integrateds
1. Capital expenditures	43.5	53.8	68.3	73.1	53.5	77.2
2. Acquisitions of properties and investment and advances	23.0	14.6	6.7	4.3	15.4	1.3
3. Dividends paid	0.1	7.0	11.6	5.8	7.7	15.1
4. Reduction in long-term debt	15.6	14.1	12.3	14.4	20.9	6.3
5. Deferred production income	0.3	1.2	0.7	-	1.9	0.1
6. Long-term receivables	5.6	0.6				
7. Redemption of shares	0.8	0.2			-	
8. Reduction in prepayments	0.2	2.1				
9. Drilling costs and other	10.7	9.7				
Total 6-9	17.3	12.6	0.4	2.4	0.6	-
Total funds used	100.0	100.0	100.0	100.0	100.0	100.0
Total 1 and 2 above	56.6	61.1	75.0	77.4	68.9	78.5

Source: See Table 7.4.

with size of firms. For the IPAC integrateds it was 34 percent but for our small firms it was 18 percent. It would appear that large corporations benefit more, than do small firms, from tax concessions relative to their total sources of funds. Fourth, the share of long-term debt in total funds generated is inversely related to size of firms. Whereas our small firms derived from this source as much as 42 percent of total funds, this percentage was 21 for the IPAC integrateds. Fifth, as firms grow, on the whole, the share of proceeds from share issues declines as a proportion of total funding. It will be observed that the share in question for the IPAC producers is a startling outlier. Sixth, in general, the aggregate share of the sales of assets, and other transactions, declines with size of firms. This percentage share was exceptionally large for our small firms. This may be explained, to some extent, by the fact that the "other" sources from proceeds represented a high proportion of the total funding for our small firms - 6.2 percent (see Table 7.4). The accounts for small enterprises lack detail and many sources of funds are often conveniently relegated to the "other" sources, not that explanations are always provided as to the composition of this item.

The percentages in Table 7.8 for small firms are based on the data of Table 7.4. If Table 7.6 is used instead, the results presented above will not be importantly affected.

Allocation of funds

Tables 7.9, 7.10 and 7.11 are statistics on the allocation of funds used.[18] In the first two tables the allocations are set out

under ten headings but in the last table nine headings are given for the sake of comparison with the results of the IPAC study.

It is seen from Table 7.9 that capital expenditures absorbed the largest proportion of the funds used by our small firms - 43 percent. When we aggregate capital expenditures with acquisitions of property, and investments and advances, the total share of these various forms of investment comes to 67 percent. This is a sizeable apportionment of total funds used. Repayment of long-term debt was the next most important allocation with 16 percent of the total, followed by drilling costs and other items. About 6 percent was absorbed by long-term receivables. The major component of this item are promisory notes, either trade notes or special notes. Finally, it will be noted that the small business devoted a trivial fraction of one percent to dividend payments and less than one percent to redemption of shares.

It transpires, small enterprises use their funds predominately for the purpose of current investments and reduction in long-term debt.

When we turn to Table 7.10 we note that, by comparison with our small firms, our large corporations allocated a higher proportion of their total funds used to capital expenditures - nearly 54 percent. But the aggregate allocation to various forms of investments - capital expenditures, acquisitions of land and properties, and investments and advances - absorbed a similar proportion, to wit, 68 percent, or one percentage point more. As for the repayment of long-term debt, although the percentage share of this apportionment is lower for large businesses, again the difference does not appear to be significant. However, distinctly more funds, percentagewise, were used by large firms on account

of divided payments. This situation is reversed with respect to retirement of shares, the respective percentages being small for both groups. Hence, it is hard to attach much importance to the observed disparities. Finally, it will be noted that large units registered a smaller share of long-term receivables. This time the disparity is marked. Probably, it points to the fact that larger firms which, as we have seen earlier, enjoy a higher liquidity than small firms do, were in position to do away with notes payable more so than their smaller counterparts.

The important finding is that large firms invested a larger proportion of their total funds used than did small firms.

In Table 7.11 we put together the results obtained by us for our small and large enterprises and the corresponding data from the IPAC study in order to show the relationships between size of firms and the different allocations of funds used.

The first relationship is that between the share of capital expenditures in total funds allocated and size of firms. A positive overall relationship is observable between the two variables. An exception are the IPAC senior producers for whom the share in question is comparable with that for our large firms. As seen, the integrateds allocated to capital expenditures as much as 77 percent of the total funds used while this share for our small firms was 43. Concerning the aggregate of acquisitions of properties and investments and advances, smaller firms allocated to this item a larger proportion of their total funds used than did large firms. Thus, whereas our small units recorded a 23 percent allocation in question, for the IPAC integrateds this percentage was a mere 1.3. And the average percentage for the three IPAC

Table 7.12

Changes in working capital, small and large firms, the oil and gas industry, Canada, 1976.

($s and percentages)

Groups of firms	No. of firms	%	Totals	Means
65 small firms				
positive	27	49.1	9,580,468	354,837
negative	28	50.9	8,992,768	321,170
net	55	100.0	587,700	10,685
51 large firms				
positive	32	66.7	267,146,308	8,348,322
negative	16	33.3	124,978,941	7,811,183
net	48	100.0	142,167,367	2,961,820
IPAC			289,520,000	8,773,333
producers	15	45.5	40,356,000	2.690,400
senior producers	8	24.2	113,070,000	14,133,750
integrateds	10	30.3	136,094,000	13,609,400
All	33	100.0		

Source: See Table 7.4.

groups was 6.7. However, the senior producers were out of line with this relationship. The finding that the above share was inversely correlated with size of firms suggests that small units were more active, in the sense here discussed, than large corporations were, in acquisitions of oil and gas land in 1976 and in other investments. The proportion of the total funds used by each of the six groups of firms that went into dividend payments shows a fairly well-defined positive relation with size of firms. The next allocation is that to the reduction in long-term debt. If we compare the results for our small and large firms with the average for the 33 IPAC corporations, we observe that as size of firms increases the relevant percentage allocation declines. However, the IPAC senior producers recorded a percentage allocation which is out of line with this trend. There is no discernible relationship between size of firms and the percentage allocation of total funds to deferred payments. Finally, the share of the "other" sources declines quite distinctly with size of firms. This aggregate item was necessary for the sake of comparisons with the IPAC data. We commented earlier that due care must be exercised when dealing with this ambiguous item.

Table 7.12 supplies information on changes in the working capital of the firms investigated. Twenty-seven of our small firms, or 49 percent of the total of 55 units, for which we had the required statistical information, used less funds than they generated and, for this reason, they recorded an increase in working capital in 1976, but 28 firms, or 51 percent of the total, used more funds than they generated and thus they experienced a decline in the capital. For the group as a whole,

Table 7.13

Changes in financial position, small (67) and large firms(51), oil and gas industry, 1976.

	65 Small firms		51 Large firms	
	No. of firms	%	No. of firms	%
1. Increased deficit	9	16.4	3	6.2
2. Reduced deficit	10	18.2	7	14.6
3. Increased surplus	16	29.1	25	52.1
4. Reduced surplus	20	36.4	13	27.1
Totals	55	100.0	48	100.0

working capital increased in that year.

The data for our large firms show that 16 firms out of a total of 48, or 33 percent, experienced a decline in working capital. This is a much lower proportion than the corresponding one for our small units. It follows that the percentage of large units, that used less funds than they generated, was much higher - 67 as compared with 49 for small firms. On this evidence, in 1976 a greater proportion of large firms, than of small firms, increased their operating surplus or reduced their deficit. By the same token, a larger proportion of small firms reduced their surplus or increased their deficit. We will come to this point later.

The net increase in working capital for the 55 small firms was almost $588 thousand. This yields an average increase per firm of $10.6 thousand. The corresponding average for our large firms was $2.9 million - 277 times larger. And it was $13.6 million for the largest corporations in the industry, namely, the IPAC integrateds. This average was 4.7 times larger than that for our large firms and 1,283 times larger than that for our small firms. These figures are mind-boggling. They underscore, on the one hand, the astonishing capital accumulation ability of the largest corporations in the industry and, on the other, the utter insignificance of small enterprises in this respect.

Table 7.13 deals with four categories of our small and large firms classified by the impact that working capital increases or decreases exerted on their surplus-deficit position: (1) the firms which recorded a decrease in working capital in 1976 and, as a result,

increased an existing deficit; (2) which decreased their existing deficit due to an increase in working capital; (3) which registered an increase in working capital and, thereby, strengthened their existing surplus position; and (4) which recorded a decrease in the capital and, in consequence, reduced their existing surplus.

The figures provided can be used in a variety of ways to measure the "success" or "failure" of financial operations of firms. If we choose for this purpose category (3), we observe that 16 small firms, or 29 percent of the total for which we had the information, increased their existing reserves because they used less funds than they generated in that year. The corresponding percentage for our large firms is considerably higher, being 52 percent. We would thus conclude that, on this basis and in the sense here discussed, large firms were more "successful" than small ones. Next, to assess the relative position of the two groups of businesses, we may focus on those firms which started in 1976 with a deficit, and which in that year experienced a decrease in their working capital, thus increasing the deficit. Category (1) indicates that there were nine such small firms, or 16 percent of the total. But the corresponding percentage for our large firms was much smaller, being 6 percent only. We see again that the performance of small firms was inferior to that of large corporations. An examination of the data also reveals - category (4) - that a larger proportion of small firms reduced their accumulated surplus than the proportion of large firms.

Finally, we may consider categories (1) and (2) together. The two categories show the total number of firms that were in deficit

positions at the beginning of 1976. There were 19 such small firms, or 35 percent of the total, while the corresponding percentage was 21 percent for our large corporations. It follows that a smaller proportion of small enterprises enjoyed a surplus. The respective percentages are 65 for small firms (36 units) and 79 for large units (38 units).

The statistics of Tables 7.12 and 7.13 provide us with insights into the relative financial strengths and weaknesses of the small firm sector. The evidence emphasizes the unique position of these enterprises in the industry. Until and when they become viable and profitable ventures in the long-run, they are confronted with a veritable galaxy of financial predicaments.

CONCLUSIONS AND POLICY RECOMMENDATIONS

General findings: the background to policy recommendations

The small firm sector is a vital and integral part of the petroleum industrial community. Whereas large producers are the main suppliers of risk-capital and technologies, small units produce very many outputs without which the industry could not operate. This co-operative coexistence of firms of different sizes ensures flexibility and efficiency for all. At any point in time, the industry is in a balance in the sense that the market forces determine both the number of firms of particular sizes and the rewards for enterprise, or penalties for a lack of it. This balance is not, and cannot be perfect.

Our findings indicate that small firms are as efficient as are their larger counterparts. At least three considerations explain this situation. First, small enterprises are, foremost, profit-maximizers, not growth pursuers like large corporations. The small unit does not exercise control over costs and prices and, because there are always many other producers, it maximizes its profit always in a highly competitive environment. Only through an efficient use of resources can it be profitable. Second, many small firms operate on a high plateau of efficiency due to various economies of specialization. Third, the manager of the small business is subject to a unique set of incentives to efficiency. He is its founder, owner, financier, risk-taker, organizer, inventor and innovator and even worker and he has a complete control of all the operations of his enterprise. Finally, his income depends directly on the performance of his firm. In a nut-

shell, the manager is the firm itself; he works for himself and the success of his business is his personal success, financially and otherwise.

Although he may be strongly imbued with the idea of profit-maximization, his success is constrained by his entrepreneurial talent, knowledge and expertise. If these endowments are inadequate, the firm will be inefficient and it will experience recurrent losses. Eventually, the unit will be eliminated from the ranks of producers by market forces. Only those entrepreneurs who satisfy the rigorous market test will stay in the industry and may grow into large enterprises. The small firm sector is thus the breeding ground for the future large corporations. But, while it takes a long time for a newcomer to become a viable producer, an unsuccessful performer may be ejected from the industry by the centrifugal forces of the market in a surprisingly short time. Once a firm has grown into a very large corporation in the oil and gas industry, it gains immortality.

The disciplines of the marketplace ensure that the most efficient, and the more efficient, firms continue their operations. These units produce larger outputs with given resources, than inefficient firms would or, to put it differently, they produce a given output with smaller inputs. As a result, the industry benefits and so does the whole economy. What is lost is private capital (and the private dream of an independent businessman). But, in consequence, the industry produces its total output with smaller total inputs. The entrepreneur who has been ousted will transfer his remaining resources, and his personal skills and knowledge, to other activities in the industry (he may

become an employee of a major) or he will go to a different industry, where his efficiency may be higher than it was in the management of an independent oil and gas business. This process of transfer of the physical and human resources to more efficient uses means a gain to society at large. All this is brought about by the impersonal forces of the market without any action on the part of the official policy-maker.

More than any other sector in the industry, the small firm sector is the realm and playground of the individual entrepreneur. His strengths and weaknesses are put to a trial and, according to his abilities, he is rewarded or penalized. Although, in general, the entrepreneurial talent is a scarce human resource, there would appear to be no shortage of it in Alberta. However, when uncertainty prevails and the rewards for enterprise are not forthcoming, this special productive factor becomes, apparently only, an endangered species. The open season on this individual is over with the acceptance and implementation by the government of new policies after 1976 which have stimulated private enterprise in the small firm sector.

We turn now to our policy recommendations which flow directly from our findings. We will trace out the major features without going into unduly detailed specifics.

Policy Recommendations

1. Creation of an environment in which private entrepreneurial talent can find its fullest expression.

The above implies, on the one hand, a favourable climate and, on the other, an appropriate set of fiscal and other incentives.

2. A favourable entrepreneurial climate.

A policy designed to achieve this objective must avoid any actions that create uncertainty. The political risk is in addition to the economic uncertainties which pervade the environment in which small businesses operate. The entrepreneur is willing to take the economic risk which is, actually, one of his most important functions. The small enterprise mostly has enough experience and flexibility to cope with even very unfavourable economic circumstances. But the uncertainties which accompany frequent changes in government policies are more difficult to deal with, for they are harder to predict, being political decision and, moreover, they may be inordinately drastic.

A possible solution to the problem of political uncertainties would be a long-term government policy towards the small firm sector. Such a policy would confront the entrepreneur with trendal developments which would be much easier to tackle than frequent, unheralded and substantial changes and shifts like those that occurred over the period 1973-76. The entrepreneur's operations would become easier in these circumstances the more he knows about the general direction and

the important specifics of such a policy. To the extent that he commands this knowledge, government policies would become more of a tractable constant than a disturbing variable in the discounting equation of the small enterprise.

3. Appropriate fiscal and other incentives.

The incentives would provide the small business with adequate rewards for enterprise and with the reinvestment funds which are badly needed in the early years of operation when the access to external finance is limited. Thus extra profits made would remain in the industry. Small firms allocate a small proportion to dividend payments and, as the sector is controlled by Canadian capital, payments of dividends abroad out of improved profits would be minimal or nil. Furthermore, the effect of plowing-in of Canadian capital into the business would strengthen the Canadian control and ownership of the sector and gradually would extend through the industry with growing businesses.

For the system of incentives to exert the maximum possible beneficial impact on small business first:

(a) The incentive system would have to benefit only small firms and at the time when it is most needed.

This implies that the fiscal incentives would be regressive to the size of firm (measured, say, in terms of net earnings per annum after expenses). As the size of firm increases, the tax and other benefits would be reduced, and when the firm has attained a critical size, the special incentives for small firms would vanish and the firm

would benefit only from those incentives which apply to all firms in the industry. In general, the smaller is the firm, the greater assistance it would enjoy from tax incentives, and vice versa. Second:

(b) The rate at which benefits decline with the size of firm would be gradual, not sudden.

At present, the rate of corporate income tax on small firms jumps from 26 percent to 46 percent when the net revenue exceeds a certain level. This sudden increase creates problems and is unnecessarily abrupt. If the change is more gradual the firm will be in a better position to adjust to it.

It does not appear that this regressive system of incentives would act as an encouragement for firms to stay small. There is no evidence that the present differential rate has exerted such an effect. We think that the desire for larger income would offset any such tendency. No doubt, many firms would, anyway, remain small for a number of reasons (unwillingness of the owner-manager to lose control of his firm, productivity considerations and so on) and they would thus keep on benefiting from the special incentives for small firms. However, nothing can be done about this possibility and, moreover, it need not give rise to a concern.

The main specifics of the proposed incentives scheme comprise the following:

Taxation

The present system of taxation is unduly complex and should be simplified as much as possible. This would, on the one hand, enable

the individual small businessman to better figure out the future tax commitments that go with particular projects and, on the other, it would reduce the present high cost of tax returns.

The present tax rate on small business income could start below 26 percent and then gradually increase to that which applies to large corporations. If this is implemented a lower than at present tax rate would apply to the "phantom" and "new" income. Similarly lower royalties and other charges could apply to the smaller units and gradually they would increase with the size of firm.

Finance

Our investigation indicates that very small units have a need for "quick" risk-finance. Such finance would enable them to capture profitable projects which cannot be financed effectively with "slow" finance. Because by the time this finance becomes available, projects may lose their projected profitability. As the small firm is not likely to obtain this "quick" risk-capital from capital venture companies, or even less so from banks and other intermediaries, it would have to be provided either by the government or it could come from private sources. The implementation of the Venture Enterprise Investment Company, proposed by the Honourable A.C. Abbott, Minister of State Small Business, is a promising possibility and should be implemented. Also, the present incentives to the private lender should be strengthened so as to make drilling and other funds more attractive than the alternative investments in relatively less risky RRSPs, RHOPs, MURBs, government bonds and others. There is, so it appears,

a substantial amount of private capital that would be willing to go into small business ventures, if appropriate incentives are given to it since drilling funds are much more risky than the alternatives that are open to private individuals and nonprincipal investors. This potential for private risk-capital should be exploited and it might provide a new and important source of it for small enterprises.

Research and Development

The recent 25 percent write-off on R&D expenditures by small businesses is a welcome measure. However, it will not assist those small businesses which, due to resource limitation, do not spend funds in this direction. Our Study reveals that many small firms have a substantial potential for innovation but have no funds to finance R&D. This potential could be exploited if direct grants and subsidies were given to deserving small firms.

Another measure that would assist the small enterprise in its research and development effort would be the establishment of Small Business Research and Development Centres at the university level. Such Centres would greatly assist small business because the universities already command the required equipment, expertise and knowledge. Thus invention and innovation at the level of the small firm would be fostered but the cost of this activity would not be borne entirely by the small business, which often is not in position to incur the necessary outlays.

Government services and advice

Our overall finding is that there is no great demand in the industry for government services and advice. The most important

explanation of this finding is the presence in the marketplace of many small highly specialized businesses which possess the knowledge and expertise to serve any requirement of the small firm sector.

It appears that special Small Business Centres at universities or other institutions of higher learning would be of great benefit to the small firm sector. Such full-fledged institutes could perform two functions, that is, teaching small business management and offering specialized advice to small business in all aspects of their operations, including technical advice. At present courses are offered in universities on some special aspects of small business. But this is not enough.

Paper work

This problem is important and any measures conducive to an alleviation of the present situation would assist small business. Reducing the time and money burden of the paper work is an urgent issue. The government has already established procedures conducive to the attainment of this objective. Paper work is a major irritant to small businessmen and it involves both direct and indirect costs. In addition to the above, we will mention the following two aspects where there is room for improvement.

Deduction of business losses from other income and easier financial conditions when small businesses are passed on to the heirs

Further measures to enable small business, who derive income from their business and one or more other sources (professional income), to spread the business losses would help the small entrepreneur. Steps

have already been taken in this direction by the government but further easing of this problem would be welcome. Again, there is the issue of the taxes that have to be paid when, after the death of the present owner, the business assets pass over to the heirs. We understand that, to pay the taxes, the heirs often have to borrow money. But the small firm is in a special situation. Whereas in a large business the death of the manager does not terminate its life, in a small enterprise this event has an entirely different aftermath. Hence, a special treatment is justified.

Other aspects of our recommendations

The establishment of a favourable entrepreneurial climate and the introduction of specific incentive measures exclusively for small firms is not likely to affect adversely the performance of these units because the market mechanism would check inefficiencies. If, what may be expected, the new incentives would increase the number of entrants into the industry, this would lead to a keener competition, and, other things being equal, the rate of profit would decline and only the more efficient would continue in production.

We do not recommend, explicitly or implicitly, that the number of small firms in the petroleum industry in Alberta be, for example, increased. There is no way, known to us, in which the right number of these units at a point in time could be assessed. Some students of the small firms sector have actually recommended that the number of businesses be increased. This attitude implies that the "right" number of these units in the industry is known to them; furthermore,

it presupposes their knowledge is above the wisdom of the marketplace. It would appear, albeit, that any attempt to increase the number of small firms in an industry is bound to fail and, moreover, at the cost of the firms which will be enticed to enter the industry. For, if the actual number of firms, created by the artificial inducements, exceeds the number that is required, viz., determined by the forces of supply and demand, the profitability will decline across the board and the excess number of firms will go bankrupt or join the ranks of the "living dead". Hence, such policy being self-defeating would also be against the interest of the small firm sector. Besides, it would entail a waste of social resources.

Our final recommendation is that:

4. <u>The management of the industry by the government should be strengthened for the benefit of the industry</u>.

There are many important functions which can be performed by the government in consultation with management and labour.

Proper management of markets, especially for gas, is an urgent issue. Many small firms have their gas reserves shut-in and are unable to put them on stream, hence, they have no return on their investments. Markets for gas should be opened either by freeing exports to the United States, promoting exports to Eastern Canada or by fostering uses for this output. There is no reason why the small firm should carry the burden of conserving resources for the future.

Second, there is the problem of oil and gas land. The price of this input has risen dramatically and the small firm is at a serious disadvantage by comparison with its large competitor. Some measures could be introduced to alleviate this situation.

Preservation of the natural environment is an important and, an almost exclusive, function of the government. And so are the many regulations affecting labour-management relations, minimum wages, employment conditions, regulations concerning subcontracting and consortia operations, the safety on the well-site and workplace; and so on and so forth.

APPENDIX 1

Sample of sixty small oil and gas firms whose chief executives were interviewed

Alpha Mud Services
Antares Oil and Gas
Aren Business Enterprises
Baxendale Seismic Consultants
Beta Well Services
Brunswick Resources
Burns D.R. Consultants
Butte Resources Canada
Canadian Hidrogas Resources
Canadian Hydrodynamics
Canadian Obas Oil
Canadian West Ventures
Cavendish Investments
Chautauqua Oil
Chemnor Industries
Chimo Equipment
Christenson Diamond Products
Clearport Petroleums
Colony Resources
Commercial Oil and Gas
Confederation Resources
Conventures
Cramac Resources
Cumming Exploration Consultants
Datametrics
Difrey Resources
Dunlop Petroleum Consultants
Executive Business Services
Foothills Diamond Coring
Garnett Drilling
Geo-Trades
Haven Oilfield Sales
Howe Sound Exploration
Hugo Petroleum Investments
Jasper Oil
Kingside Minerals and Investments
Kandex Resources and Development
Lariat Oil and Gas
Lester C.D. and Associates
Oil Country Tabular
Oil Pressure Survey and OPSCO
Oleum Exploration
Pan West Resources
Penstar Petroleum
Pathelen Resources
Petrol Oil and Gas Company
Petrosol International
Phoenix Ventures
Placer CEGO Petroleum
Reef Mud F.O.S.
Rideau Exploration
Roger M. Gordon Land Services
Simmons Drilling
Strom Energy
T. Fekete and Associates
True West Land and Reduction Services
Universal Gas Company
Warpet Exploration Company
Western Resources Production
Zodiac Oil and Gas

APPENDIX 2

Sample of sixty-five small oil and gas firms with assets of less than $10 million in 1976

Acroll Oil and Gas
Albany Oil and Gas
American Eagle Petroleums
Antares Oil and Gas
Baxendale Seismic Consultants
Bearcat Explorations
Bluewater Oil and Gas
Brunswick Resources
Cairn Petroleums
Canadian Hidrogas Resources
Canadian Hydrodynamics
Canadian Obas Oil
Canadian Southern Petroleum
Canuco
Clarepine Developments
Clearport Petroleums
Comaplex Resources International
Commercial Oil and Gas
Cumming Exploration Consultants
Czar Resources
Delta Petroleum Corporation
Difrey Resources
Dunlap Petroleum
Edmonton International Industries
Garnett Drilling
Giant Reef Petroleums
Howe Sound Exploration
International Tika Resources
Lariat Oil and Gas
Lassiter Kuma Oils
Lobell Oil and Gas
Lochiel Exploration
Madison Oils
Midcon Oil and Gas
Monterey Petroleum Corporation
National Petroleum Corporation
Nemco Exploration
New North Oil and Gas
Oilex Industries
Omega Hydrocarbons
Page Petroleum
Peregrine Petroleum
Pethelen Resources
Petrol Oil and Gas Company
Petromines
Place Oil and Gas Company
Radial Resources
Ram Petroleum
Republic Resources
Rio Alta Exploration
Savanna Resources
Sogepet
Strom Energy
Summit Resources
Tisdall W.H. Resources
Transcanada Resources
Transcontinental Resources
Turner Valley Holdings
Twin Richfield Oils
Ulster Petroleums
United Western Oil and Gas
Universal Exploration
Universal Gas Company
Western Resources Production
Western Warner Oils

APPENDIX 3

Sample of fifty-one oil and gas firms
with assets of more than $10 million in 1976

Alberta Energy Co.
Alberta Natural Gas Co.
Alminex
Amalgamated Bonanza Petroleums
Aquitaine Co. of Canada
Asamera Oil Co.
Bow Valley Industries
Budget Petroleum Co.
Buttes Gas and Oil
Canada Northwest Land
Canadian Export Gas and Oil
Canadian Homestead Oil
Canadian Merril
Canadian Occidental Petroleum
Canadian Reserve Oil and Gas
Canadian Superior Oil
Canadian Western Natural Gas Co.
Candel Oil
Chieftain Development Co.
Conventures
Coseka Resources
Decca Resources
Dome Petroleum
Hudson's Bay Oil and Gas Co.
Husky Oil
Merland Explorations
Murphy Oil Co.
Norcen Energy Resources
North Canadian Oils
Nowsco Well Service
Numac Oil and Gas
Oakwood Petroleums
Ocelot Industries
Paloma Petroleum
Panarctic Oils
Pancana Industries
PanCanadian Petroleum
Pembina Pipeline
Petrofina Canada
Peyto Oils
Quasar Petroleum
Ranger Oil (Canada)
Scurry-Rainbow Oil
Siebens Oil and Gas
Skye Resources
Texaco Canada
Total Petroleum (N.A.)
United Canso Oil and Gas
Voyageur Petroleums
West Coast Petroleums
Western Decalta Petroleum

APPENDIX 4

Special accounting forms which were sent to small oil and gas firms in Calgary

ACCOUNTING INFORMATION

NAME OF FIRM: _____ TEL.NO: _____

ADDRESS: _____ THE RESPONDENT: _____

Column I: The 1971 accounting year OR the first full year of business if your firm started business less than five years ago. Please, indicate the year for which the required information is given.

Column II: The most recent accounting year.

Please, give all figures to nearest $.

1.TRADING AND PROFIT AND LOSS

		I	II
1. Date when accounting year ended	1		
2. Total Sales(a)	2		
3. Wages and salaries paid(b)	3		
4. Employer's national insurance, health and pension contributions, and similar	4		
5. Directors' salaries, pensions and other salary costs(c)	5		
6. Rent of properties leased	6		
7. Rent of plant, machinery and equipment(d)	7		
8. Bank interest paid	8		
9. Other interest paid, including hire purchase interest charges	9		
10. Gross trading profit	10		
11. Depreciation	11		
12. Net profit before tax	12		
13. Net profit after tax	13		
14. Dividends (e)	14		
15. Proprietor's/Partners' drawings (including salaries) (f)	15		

(a) Net of trade discounts, but before cash discounts.
(b) Excluding directors' salaries (heading 5) and proprietor's or partners' salaries heading 15.
(c) This does not cover proprietor's or partners' salaries , which are to be included under heading 15.
(d) Exclude short term plant and other hire.
(e) Companies only.
(f) Unincorporated businesses only.

2. ASSETS, LIABILITIES AND CAPITAL

		I	II
CURRENT ASSETS			
1. Cash and stock balances	16		
2. Stocks and work in progress	17		
3. Debtors	18		
4. Other current assets	19		
5. TOTAL CURRENT ASSETS	20		
CURRENT LIABILITIES			
6. Bank overdrafts and loans	21		
7. Current tax liabilities	22		
8. Acceptance credits and bills payable	23		
9. Other creditors	24		
10. TOTAL CURRENT LIABILITIES	25		
FIXED ASSETS, NET OF DEPRECIATION			
11. Land and buildings	26		
12. Plant and machinery	27		
13. Furniture and fittings	28		
14. Cars, trucks and other transport equipment	29		
15. Goodwill, patents, trademarks and other intangible assets	30		
16. Other fixed assets	31		
17. TOTAL FIXED ASSETS, NET OF DEPRECIATION	32		
18. Hire purchase balances outstanding with suppliers (a)	33		
19. Mortgages, debentures and other term loans	34		
20. Preference shares	35		
21. Ordinary shares and share premium account	36		
Other reserves and profit and loss balances			
22. PLUS	37		
23. MINUS	38		

During the period between the first and last accounting period shown above, have you:

		Yes	No
Made a bonus issue of shares?	39		
Revalued a substantial part of your assets?	40		

(a) Include all hire purchase balances outstanding, wherever they appear in your accounts.

APPENDIX 5

The main questionnaire

The questionnaire contains 82 questions dealing with 26 different aspects of the small firm. We interviewed 60 business executives and several other persons who had the relevant knowledge and expertise. The interviews, which lasted, at least, one hour, were recorded on tapes. They were followed up by telephone calls to fill in gaps or to obtain additional information. Throughout, we looked for explanations, comments, views and elaborations rather than just "Yes"s and "No"s as responses to our questions. Although the number of questions in the questionnaire was very large, many were self-eliminating or not applicable to particular cases. For example, if a firm was operated by one or two principals, all the questions concerning labour did not apply. Again, some information such as output produced could be obtained prior to interviews. Finally, some inputs were deducted from observation of the respondent, for instance, some psychological and physical attributes of the businessmen. As a result, no single person was actually exposed to the ordeal of having to answer all the questions. After a few interviews we developed time-saving techniques of obtaining the required information and we thus had a better opportunity to listen to extensive comments that the executives would make on their work. In the process, we learned about new issues which were investigated subsequently at the expense of other problems of lesser importance.

QUESTIONNAIRE

1. General

1.1 What is the age of your firm?

1.2 How do you explain its small size?

1.3 If you know of any small firms which ceased to operate, how do you explain it?

2. Output

2.1 Is your output a physical product or a service?

2.2 Do you produce one or several outputs?

2.3 Does your output embody any particular advanced or scarce technologies? Is it technologically unique?

3. Market

3.1 Are you dependent on one large customer?

3.2 To how many small and large firms do you sell your output?

3.3 Do you compete with large firms in the same market?

4. Competition

4.1 What is the degree of competition with which you are confronted?

4.2 In what areas does your main competitive advantage lie?

4.3 What particular changes have you introduced in your business to strengthen your competitive position?

5. Organization

5.1 What is the form of organization of your firm?

5.2 Is your firm owned and managed by one single individual?

5.3 Who are the equity shareholders?

6. Decision-making

6.1 In making your principal decisions are you entirely independent from outside control? - from inside control?

6.2 Do you control any other firms and what form does this control take?

7. Share of market

7.1 What is approximately your share of the market for your output?

7.2 Can you influence the price at which you sell your output?

7.3 How do you determine the price at which you sell your output?

8. Value of assets

8.1 What is the total value of your assets?

9. Employment

9.1 What is the total number of persons employed (managers, administrative staff and production labour)?

10. Management

10.1 Is the chief executive of this firm a salaried manager?

10.2 Is he the original founder of the firm or a member of the founder's family?

10.3 What is his sex, nationality, age, education and experience?

11. Labour-management relations

11.1 Comment on the labour-management relations in this firm.

11.2 Do you think that excellent labour-management relations improve the productivity of both management and labour?

12. Recruitment of labour

12.1 What methods do you use when hiring the kind of labour that is the most suitable for this firm?

12.2 Do you have difficulties in getting this kind of labour?

13. Labour training

13.1 Do you train your own labour?

14. Management salaries

14.1 Are the managerial salaries paid in this firm higher, lower or comparable with those paid by large firms in this industry for similar type of work (explain the disparity, if any)?

15. Labour wages

15.1 How do wage rates paid in this firm compare with those paid by large firms in this industry for comparable work (explain the disparity, if any).

16. Productivity of labour

16.1 What factors affect the productivity of labour in this firm?

16.2 Is the productivity of labour higher or lower in this firm by comparison with that in larger firms and for what reasons?

17. Efficiency use of resources

17.1 Do you think that the overall use of resources in a small firm like yours is higher or lower than that in a larger firm and for what reasons?

18. Finance

18.1 What were the sources of finance when your firm was first established?

18.2 What are the sources of finance at present?

18.3 Do you need external finance?

18.4 If you tried but failed to obtain adequate external finance, what were the reasons for it?

18.5 Do you think that, by comparison with large firms, small firms have a limited access to external finance?

18.6 Do you think that financial instituttions fail (succeed) to meet the legitimate finance requirements of small firms?

18.7 Do you command all the knowledge of the financial services available to you and of the costs and terms of these services?

18.8 Is there an urgent need for government-sponsored finance?

18.9 What policy would you recommend in order to improve the present supply and terms of external capital to small firms especially that of long-term risk-capital?

19. Performance

19.1 Has your firm been a viable productive unit (growing profits and a satisfactory rate of expansion)?

19.2 If this has not been the case, what factors have been responsible for your lack of success?

19.3 Sum up and explain the prerequisites for a successful operation in this industry.

20. Innovation

20.1 Have you patented any inventions?

20.2 What proportion if any of your patented inventions have become innovations?

20.3 What nonpatented innovations have you introduced in your firm?

20.4 What factors have inhibited or stimulated your innovative effort?

20.5 Do you obtain any assistance to fund a commercial exploitation of a technical innovation?

20.6 Do you think it is necessary for small firms to innovate in this industry?

20.7 How do you obtain the up-to-date technologies?

20.8 Elaborate on the role of the small firm in this industry concerning innovation.

20.9 Give us examples of innovations made by small firms in this industry.

20.10 Appraise the present government policies concerning invention and innovation in the small firms in this industry.

20.11 What kind of government policy would you suggest to stimulate the innovative activities in small firms?

21. R&D expenditures

21.1 Do you regularly incur expenditures on R&D?

21.2 If you do not incur such expenditures, what are the reasons for it?

21.3 Do you feel there is an urgent need to provide small firms with financial and other facilities to stimulate their research and development activities?

22. Government policies

22.1 Comment on government intervention in the economic affairs of the small firm.

22.2 Do you believe yourself to be operating in a generally friendly and encouraging or discouraging, and even hostile, climate as a result of government policies?

22.3 What kind of assistance have you received from the government that has been beneficial to you?

22.4 Which government policies have been particularly harmful to small firms?

22.5 What government policies would you suggest with a view to improving the viability and prospects of small firms?

22.6 Do you in general welcome or resent government assistance and advice?

22.7 On what grounds should the government attempt to assist small firms when they lose their productive viability?

23. Taxation

23.1 Appraise the burden of the present taxation on small firms.

23.2 What are the effects of the present system of taxation on your business?

23.3 What specific changes in the present taxation would you suggest?

24. Government finance

24.1 Have you benefited from government finance in any form?

24.2 In what particular form would this finance be most beneficial to you?

25. Government managerial and other business services

25.1 Would government managerial, advisory and other services improve matters in this firm?

25.2 What kind of government services does your firm need most?

25.3 What has been the contribution made to your efficiency by the government and by what means has it been achieved?

26. Paper work

26.1 What government agencies, and others, ask you to fill in forms and provide information, otherwise?

26.2 Comment on the volume, complexity and cost of this work.

26.3 Of what value are the officially published statistics to you?

26.4 Express your evaluation of the present system of collecting information.

APPENDIX 6

The supplementary questionnaire

An additional questionnaire dealing with the personal attributes of chief executives was used by us. A small sample of the persons interviewed were asked some questions from this questionnaire. The material obtained was used in Section 4 of this Study. Our experience has been that the respondents found the questions interesting. We kept this supplementary questionnaire "up the sleeve" for those executives who demonstrated a particular eagerness in answering questions from the main questionnaire. We thus tended to exploit their cooperation and spent a few extra minutes discussing their personal characteristics and experiences as entrepreneurs.

1. Have you always felt a high need for achievement?
2. Do you reject and resent authority and routine?
3. Do you have a strong desire to be independent?
4. Have you always been seeking out challenge?
5. Do you perceive that rewards follow from your own behavior and attributes rather than being the result of forces beyond your control?
6. Can you cope easily with long hours of hard work?
7. Do you remain cool and maintain self-control when pressures of all kinds are building up?
8. Are you a person who can quickly identify relationships in complex situations, who learns quickly, and resolves successfully difficult issues?
9. Are you persistent and tenacious in pursuing your objectives? Do you feel a strong sense of urgency that things should be done?
10. Would you agree (disagree) that you take calculated risk by carefully analyzing actions and consequences prior to decision-making?
11. Do you accept things the way they are and deal with them in a practical manner?
12. Do you like to delegate decisions or go for in-depth team participation?
13. In answering the question of why you decided to set up your own business, can you identify a single event which would explain this decision? A few related events?

TECHNOLOGICAL INNOVATION STUDIES PROGRAM

PROGRAMME DES ÉTUDES SUR LES INNOVATIONS TECHNIQUES

REPORTS/RAPPORTS

	AUTHOR(S)/AUTEUR(S)	UNIVERSITY/UNIVERSITÉ	REPORT TITLE/TITRE DE L'OUVRAGE
1.	I.A. Litvak C.J. Maule	Department of Economics, Carleton University.	Canadian Entrepreneurship: A Study of Small Newly Established Firms, October, 1971.
2.	Harold Crookell	School of Business Administration, University of Western Ontario.	The Transmission of Technology Across National Boundaries, February 1973.
3.	R.M. Knight	School of Business Administration, University of Western Ontario.	A Study of Venture Capital Financing in Canada, June, 1973.
4.	Blair Little R.G. Cooper R.A. More	School of Business Administration, University of Western Ontario.	The Assessment of Markets for the Development of New Industrial Products in Canada, December 1971.
5.	K.R. MacCrimmon W.T. Stanbury J. Bassler	Faculty of Commerce and Business Administration, University of British Columbia.	Risk Attitudes of U.S. and Canadian Top Managers, September, 1973
6.	James C.T. Mao	Faculty of Commerce and Business Administration, University of British Columbia.	Computer Assisted Cash Management in a Technology-Oriented Firm, March, 1973.

7.	J.W.C. Tomlinson	Faculty of Commerce and Business Administration, University of British Colombia.	Foreign Trade and Investment Decisions of Canadian Companies, March, 1973.
8.	Gérard Garnier	Faculty of Management University of Sherbrooke.	Characteristics and Problems of Small and Medium Exporting Firms in the Quebec Manufacturing Sector with Special Emphasis on Those Using Advanced Production Techniques, August, 1974.
9.	I.A. Litvak C.J. Maule	Department of Economics, Carleton University.	A Study of Successful Technical Entrepreneurs in Canada, September, 1972.
10.	M.R. Hecht J.P. Siegel	Faculty of Management Studies, University of Toronto.	A Study of Manufacturing Firms in Canada: With Special Emphasis on Small and Medium Sized Firms, December, 1973.
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14.	M. James Dunn Boyd M. Harnden P. Michael Maher	Faculty of Business Administration and Commerce, University of Alberta.	An Investigation Into the Climate for Technological Innovation in Canada, May 1974.

15. I.A. Litvak C.J. Maule	Department of Economics, Carleton University.	Climate for Entrepreneurs: A Comparative Study, January, 1974.
16. J. Robidoux Gérard Garnier	Faculté d'administration, Université de Sherbrooke.	Factors of Success and Weakness Affecting Small and Medium-Sized Manufacturing Businesses in Quebec, Particularly those Businesses Using Advanced Production Techniques, December, 1973. Facteurs de Succès et Faiblesses des Petites et Moyennes Entreprises Manufacturières au Québec, Spécialement des Entreprises Utilisant des Techniques de Production Avancées, décembre, 1973.
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36. John P. Killing	School of Business Administration, University of Western Ontario.	Manufacturing Under License in Canada, February, 1975 (Ph.D. Thesis).
37. Peter R. Richardson	School of Business Administration, University of Western Ontario.	The Acquisition of New Process Technology by Firms in the Candian Mineral Industries, April, 1975 (Ph.D. Thesis).

38. Steven Globerman	Faculty of Administrative Studies, York University.	Sources of R&D Funding and Industrial Growth in Canada, August, 1975.
39. R.G. Cooper	Faculty of Management, McGill University.	Winning the New Product Game, June, 1976.
40. Peter Hanel	Department of Economics, University of Sherbrooke.	The Relationship Existing Between the R&D Activity of Canadian Manufacturing Industries and Their Performance in the International Market, August, 1976.
41. Albert R. Wood Richard J. Elgie	School of Business Administration, University of Western Ontario.	Early Adoption of Manufacturing Innovation, 1976.
42. Robert G. Cooper	Faculty of Management, McGill University.	The Causes of Commercial Failure of New Industrial Products, October, 1977.
43. James T. Goode	Department of Commerce and Business Administration. University of British Columbia	Japan's Postwar Experience With Technology Transfer, December, 1975.
44. Robert Knoop Alexander Sanders	Department of Management, Concordia University.	Furniture Industry: Attitudes Towards Exporting, May, 1978.
45. Stephen G. Peitchinis	Department of Economics, University of Calgary.	The Effect of Technological Changes on Educational and Skill Requirements of Industry, September, 1978
46. Christian Marfels	Department of Economics, Dalhousie University.	Structural Aspects of Small Business in the Canadian Economy, May, 1978.

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55. R.A. More	School of Business Administration, University of Western Ontario.	Development of New Industrial Products: Sensitivity of Risk to Incentives. (January 1979)
56. Rein Peterson	Faculty of Administrative Studies, York University.	A Study of the Problems Brought to the Attention of the Business Student Consulting Teams Sponsored by the Ontario Government's Small Business Assistance Programme. (February, 1979).
57. Robert G. Cooper	Faculty of Management, McGill University.	Project NEWPROD: Identifying What Makes a New Product a Success (February 1979).
58. George F. Farris	Faculty of Administrative Studies, York University.	Comments on the Course: Management of Creativity and Innovation (February 1979).
59. J. Graham Smith	Faculty of Management McGill University.	The Renewable Energy Business Sector in Canada: Economic Prospects and Federal Government Initiatives (May 1979).
60. J.W.C. Tomlinson	Faculty of Commerce & Business Administration University of British Columbia.	Cross Impact Simulation of the Joint Venture Process in Mexico (December 1978).
61. Robert H. Grasley Jerry D. Dermer	Faculty of Administrative Studies York University. Faculty of Management Studies University of Toronto.	The Status of Innovation in the Strategies of Larger Canadian Corporations (March 1979).

62. Z.M. Kubinski	Department of Economics University of Calgary	The Small Firm in the Albertan Oil and Gas Industry. (February 1979).
63. Don S. Scott R.M. Blair	Faculty of Engineering University of Waterloo	The Technical Entrepreneur. (May 1979). Available from the authors.
64. Harvey F. Kolodny	Faculty of Management Studies. University of Toronto.	Sociotechnical Study of Productivity and Social Organization in Mechanical Harvesting Operations in the Canadian Woodlands. (May 1979).

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